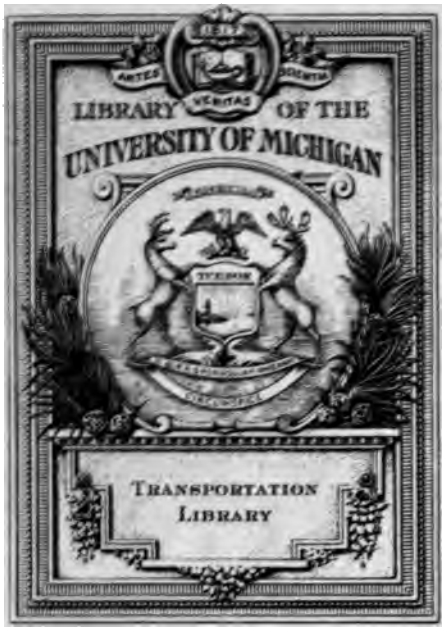
EXPRESS TRAINS

ENGLISH AND FOREIGN

EXPRESS ENGINE MIDLAND RAILWAY 1908

By E. FOXWELL and T. C. FARRER



EXPRESS TRAINS

ENGLISH AND FOREIGN

BEING

A STATISTICAL ACCOUNT

OF

ALL THE EXPRESS TRAINS OF THE WORLD

WITH

RAILWAY MAPS OF GREAT BRITAIN AND EUROPE

BY

E. FOXWELL AND T. C. FARRER

LONDON
SMITH, ELDER, & CO., 15 WATERLOO PLACE
1889

oc Voyages of J.C.C.

Latin? Rich? Capt. [illegible]

1 Sailing Ship St. John to

Walter [illegible] Liverpool [illegible]

2 Steamer Cunard Liverpool [illegible]

Boston 1869

3 Steamer Russia N.Y. to Liver[illegible]

Mother Edgar Mrs. Callen, [illegible]

Callen, Sadie Callen, Willie

[illegible] 1870

4 Steamer? Cunard to Boston 10

5 Steamer Fulda? ~~Hamb~~ [illegible]

Hamburg. [illegible] [illegible]

1877

6 Steamer? Liverpool to N.Y. Cal[illegible]

[illegible] 1

~~7 [illegible] ? [illegible] Hamb[illegible]~~

~~[illegible]~~ Capt. [illegible]

7 Steamer City of Rome N.Y. M[illegible]

[illegible]

Father [illegible] Mrs. [illegible]

1885

Transport.

PREFACE

THE OBJECT of the following pages is to show, as accurately as possible, the speed of Fast Trains in various parts of the world, and the price paid for using them.

For this purpose we have taken two standards: first, the speed including all stops, this figure being perhaps of most interest to the general traveller, since it shows the rate at which long stretches of journey are accomplished, irrespective of frontiers, custom-houses, and other checks to locomotion. Secondly, we have taken the speed excluding stoppages, i.e. the average rate attained by the locomotive during its journey. And, since this figure gives a fairer general basis for comparing the speeds on different railways, we have arranged the various administrations in this order in each country.[1]

Our standard for an Express train in Great Britain[2] and the United States is *any train which attains a speed, including stops, of* 40 *miles an hour*, but it must, as a rule, cover a distance of at least forty miles.

In other countries we call 'Express' *any train which attains a speed, including stops, of* 29 *miles an hour*, this being quite the common Continental express speed.

Certain trains on very hilly ground are admitted even when they fall a mile or two below their respective standards.

It should be remembered that we do not attempt to estimate at their fair value the innumerable other details which bring a railway up to a high or down to a low standard, but we confine our comparison to speed and cheapness only.

For the remarks on Great Britain, Holland, and Belgium the responsibility rests with E. FOXWELL, for the rest with T. C. FARRER.

[1] See tables on pp. 66, 95, 165–179.

[2] We have shown Ireland both at English and at Continental standard.

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PART I.

EXPRESS TRAINS IN GREAT BRITAIN

August 1888.

Ἡμεῖς δ', ὡς τὸ πάρος περ, ἐποτρυνώμεθα πομπήν.
οὐδὲ γὰρ οὐδέ τις ἄλλος, ὅτις κ' ἐμὰ δώματ' ἵκηται
ἐνθάδ' ὀδυρόμενος δηρὸν μένει εἵνεκα πομπῆς.

Od. viii. 31–33.

INTRODUCTION.

EXPRESS trains have been coming on so rapidly of late [1] that they must soon emerge from their childhood and be recognised as one of the most striking factors in modern life. Meanwhile they have found a place in serious literature. Instead of absurd Munchausen yarns as to the impossible things they do, 'and did, some 40 years ago,' we now get conscientious prose and sober fact.

At a meeting of the Statistical Society in April 1884 Lieut. H. B. Willock read his exhaustive account of 'English Express Trains in 1871,' which was the year preceding that when the Midland ushered in its revolution of conveying third-class passengers by every train. This paper gave the earliest census of our fast trains. In September 1883 Mr. E. Foxwell had contributed to the same Society's *Journal* 'English Express Trains in 1883,' and this was the first published record on the subject.

The present pamphlet, besides describing English expresses for the year 1888, making the third census of these, contains an account by Mr. T. C. Farrer of similar trains in every part of the world. It is the first time this latter task has been attempted, and the difficulties that baffle one in a pioneer survey of such wide and distant areas can be best appreciated by those who have found the preparation of the statistics for England itself a sufficiently maddening affair.

Our object is to give a report of the fast—as opposed to the 'stopping'—trains of each country, that is, of the trains most used by travellers and active business men.

Now in England it happens that nine-tenths of our fast trains reach the standard of '40 miles an hour including stops' (or a *journey-speed* of 40 miles an hour), and the other tenth fall short only because their journey is exceptionally hilly, or exceptionally brief, or exceptionally subject to delay. (We allow for these exceptional cases, and admit such trains to the rank of 'express' if their journey-speed is as good as 35 miles an hour; for such trains are quite as excellent as their more favoured brethren. See M. S. & L. and L. & Y. trains, pp. 37 and 55.)

Thus our regulation test of '40 miles an hour including stops' for any train wishing to be called 'express' in England is not an artificial one, but a natural definition supplied by the companies themselves in their every-day time-bills.

On the continent of Europe as a rule a train is held to be

[1] See p. 69.

magnificent, worthy of heroic adjectives, and not to be rudely attempted by third-class passengers, if its journey-speed is as high as '29 miles an hour.' There trains which attain such speed form a group and tower above the ruck, just as in England it is trains that reach '40 miles an hour inclusive' which stand apart from the common 'stopping' train.

In the United States the various railway systems are adopting the English pitch of '40 miles an hour inclusive' as the limiting standard to be aimed at by a fast train.

It requires some energy to satisfy this test. Imagine a train shot suddenly out from its starting point at 40 miles an hour, maintaining with unflagging uniformity this same high speed uphill, through suburbs and junctions, persisting at this pace without a moment's pause for two or three hundred miles, till it come to an instantaneous stop at its distant terminus; the mildest of the trains we call 'express' will arrive as soon as this imaginary one, though our actual train has had to labour slowly up the hills, to slack for bridges, curves, or junctions, besides consuming precious time in four or five stoppages of as many minutes each. The feeblest 'express' is as smart as this; what then shall we say of trains which secure an 'inclusive speed' of nearly *fifty* miles an hour over summits of a thousand feet? (See pp. 10, 15, 6.)

We do not find such every-day performances outside our island, and, while protesting against that gluttonous patriotism which must insist on native supremacy in every department of life, we do indulge in considerable pride when we contemplate the express trains of our country. It is not only because of the importance of the changes due to speed, but because here at any rate we are unexcelled.

In making the census for Great Britain we choose the month of *August*, as it is then that our expresses reach their maximum each year. So with the foreign countries, each is shown at its best.

The different companies are taken in order of 'speed excluding stops,' or, in other words, according to their 'running average.' That is, we add up the total number of 'express' miles run daily by each company, add up the total number of minutes spent in actually *running* those miles—deducting all the time consumed in stops—and rank the companies according to the resulting speed obtained. To enliven the generic pictures so produced, we insert examples of the best *individual* trains of each company.

Note.—The writer of the part on Great Britain again expresses his great indebtedness to those officials of the various companies—the much-abused Southern as well as the immaculate Northern—who have so kindly assisted him from time to time.

As we take the various companies in the order of their *average speeds excluding stops* ('running average'), we begin with the

GREAT NORTHERN.

GOOD wine needs no bush, and it would be waste of time to praise this line. The youngest of our great companies—the main line was opened just before the Exhibition of 1851—it began life with the benefit of other people's experience, and instantly started off on a career of speed whose brilliance has never since been dimmed. Coming last upon the scene it naturally found few important places left it to exploit, and the part of England through which it passes is a dreary stretch of agriculture. But the Great Northern is fed from its extremities; it has the shortest route to *Leeds* and *Bradford*, and above all, runs so straight to *York* that the 'East Coast Route' from London to *Edinburgh* is 8 miles shorter than that of the North-Western, 14 shorter than by the Midland. This alone, however, would not account for the remarkable share of traffic secured by the line, remarkable when we consider the small size of the system and its late entry into the competition. It is the straightforward dash of the Great Northern, and the high standard of excellence maintained in all its services, which have won it the distinguished place it holds in public estimation. Especially in regard to speed it has long merited the gold medal—a fact to be borne in mind now that the recent efforts of the North-Western have dazzled some observers. What the Great Northern would show us if it controlled the entire road to Scotland we can only conjecture; at present much of its own high-pressure energy has to be expended in stirring up the North-Eastern and North British to do their share towards the main result. Would any company except the Great Northern ever have contemplated and carried out an effective competition for traffic between London and *Manchester*, with such a roundabout route, and the extra disadvantage of having to work in harness? But in matters of speed and smartness the Great Northern has worked like an inspiriting leaven on everything it has touched.

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	Mileage	
			H. M.				
188	King's Cross—York (Scotch expresses)	14	4 9	45⅓	47¾	2,632	
	Do. Do.	(2D) 6	4 27	42¼	45⅝	1,128	8.55, 11.45 down; 10.0, 12.15, 12.42, 9.37 up
185½	King's Cross—Leeds	(6D)14	4 15	43⅝	47	2,597	5.15, 7.40, 10.10, 1.30, 3.20, 5.45 down; 7.15, 9.0, 10.0, 10.30, 1.10, 2.50, 5.30, 10.0 up
[17	Wakefield—Bradford	(5D)11	0 29	35	38½]	—	in connection with the Leeds trains; not reckoned in the total, because their short run is over such steep gradients ($\frac{1}{50}$)
138½	King's Cross—Retford	(3D) 7	3 2	45⅔	48	969	†2.30, 5, 5.30—10, 12.30, 3, 5
105½	Do. —Grantham	2	1 58	53⅜	53⅔	211	2.0 up and down Manch.
90	Nottingham—York	1	2 4	43½	47¾	90	12.30 down '*Seaside*'
22½	Do. —Grantham	12	0 31	43	44½	267	
24¾	Lincoln—Grantham	4	0 35	42½	44⅓	99	
76¼	Peterboro'—King's Cross.	1	1 53	40½	44½	76	9.17 A.M. up
32	Doncaster—York	2	0 50	38½	42⅝	64	off 1.30 and 5.45 *ex* King's Cross
58	Cambridge—King's Cross	14	1 22	42½	45¾	812	2 of these added in Nov. 1888
	Total	77	averag.	43⅛	47	8,945	

Brilliant as this is, it becomes still more creditable to the company when we remember the small length of its line compared with the North-Western or Midland. But to this amount of express mileage run by the Great Northern itself we must add its

BEST EXPRESSES.

Miles		Time	Speed
		A.M.	
	King's Cross.	10 0	} 54
105⅜	Grantham	11 57	
		12 2	} 56¼
187⅞	York	1 30	

Inclusive speed = 53⅔
Running average = 55

This train ran during August 1888, and represents the climax of the 'race to Edinburgh.' Since Sept. 1 the time to Edinburgh has relapsed to 8½ hours, and from King's Cross to York 3¾ hours. During August it often ran to York under 3½ hours.

Miles		Time	Speed
		P.M.	
	King's Cross.	1 30	} 52⅗
76¼	Peterborough	2 57	
		3 1	} 52
156	Doncaster	4 33	
		41	} 45
174	Selby	5 5	
		8	} 43½
187¾	York (tickets)	5 27	
		29	
188	York (station)	5 30	

Inclusive speed = 47
Running average = 50½

Heavy train for Leeds, Bradford, York, &c.

share (599 miles) of the 'Cheshire Lines' mileage, see p. 39; thus the complete total for the Great Northern is a daily express mileage of 9,544 miles, with a running average of 47 miles an hour.

BEST EXPRESSES—*continued.*

Miles		Time	Speed
		A.M.	
	King's Cross . . .	9 45	
$105\frac{3}{8}$	Grantham . . .	11 49	51
		53	
156	Doncaster . . .	12 49	54
		52	
175	Wakefield . . .	1 15	50
		18	
185	Holbeck . . .	1 31	46
		33	
$185\frac{1}{2}$	Leeds	1 35	

Inclusive speed = $48\frac{2}{5}$ Running average = 51

This excellent train was put on Nov. 1, 1888. (Reaches *Bradford* at 1.48.) *Manchester* is 3 miles farther from Euston; but the quickest North-Western trains take 25 minutes longer than this train to Leeds, which runs over a much steeper route.

MIDLAND.

HERE is a line with magnificent pluck and enterprise—too much sometimes for the peace of mind of its neighbours. English people, at least those who live north of the Thames, must for ever thank this company for the fact that third class travellers may go by any express, and that third class accommodation has been raised to its present standard of excellence. Perhaps in the long run the abolition of second class, initiated by the Midland and since adopted in part by the Great Northern and Scotch lines, will prove to be another benefit both to the public and the shareholders. The Midland again must be credited with most of the quicker running introduced on the North-Western during the last ten years; for with the entry of the former company into Liverpool and Manchester, and later when it pushed boldly over the hills to Carlisle, it became necessary that the North-Western should smarten up its time-tables unless it wished to suffer from a serious defection of passengers. The 'innovating' energy of the Midland was also shown in its early efforts to introduce Pullman cars, glasses of milk *en route*, cheaper cups of tea, luncheon baskets, and many other important trifles. But it does not follow that a public benefactor is beloved by its rivals.

From the figures given it will be seen that the Midland 'running

average' is only a little less than that of the Great Northern. Now the Midland gradients are exceedingly heavy, while the Great Northern has a very comfortable task—except for the bit north-west of Doncaster. It would therefore appear as if the Midland, and not the Great Northern, should bear away the palm for meritorious speed. And if the Midland were punctual, there would not be the least hesitancy in so adjudging. But unfortunately the gross and notorious unpunctuality of some of the most important Midland expresses (*e.g.* the Scotch) altogether stultifies any serious attempt to make a fair comparison between its advertised programme and the competitive ones issued by North-Western and Great Northern; for these two rivals do as a rule—especially the first—fulfil what on paper they have promised. However, the squad of Leeds-and-Bradford expresses undoubtedly observe first-rate time, and as regards speed are second to none in England; but they are comparatively light trains.

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	Mileage	
	(a) Bristol—Leeds, York, Hull, &c.						
			H. M.				
132¼	Derby—Bristol	2	3 21	39½	44	264	2.5 *ex.* Derby, 12.20 *ex.* Bristol
90	Birmingham—Bristol	1	2 15	40	42½	90	3.5 *ex.* Bristol
42¼	Derby—Birmingham	(2c) 3	1 1	41½	46	127	8 others average 1.11
76	Do. —Leeds	2	1 55	39	44	152	8.50 A.M. *ex.* Bristol, midn. *ex.* St. Pancras
82½	Do. —York	2	1 59	41½	45	165	W. of Eng. day expresses
40	Milford—Hull	6	0 56	43	45	240	
128¾	Derby—St Pancras	1	3 18	39	43	129	Mail arriving St. Pancras 5.15 A.M.
	Total	17	averag.	41¼	44⅓	1,167	
	(b) London—Liverpool and Manchester.						
191¼—202½	St. Pancras—Manchester	12	4 24½	43¾	46	2,306	One (2.0 down) runs *viâ* Nottingham
220¼	St. Pancras—Liverpool	1	5 10	42⅝	47½	220	3.40 down
62¾	Manchester—Derby	4	1 38	38⅝	42⅝	251	3.37 A.M., 12.30 A.M. down; 1.0, 4.55, up
121	Leicester—Liverpool	3	2 56	41¼	45	363	2.23 down; 11.0 and 3.0 *ex* Liverpool
	Liverpool—Derby	2	2 22	38⅝	43½	183	1.5 *ex* Derby; 2.24 and 11.20 up
91½	Do —W. of Eng. trains	2	2 15	40⅝	45	183	3 50 down, 11.40 up
37¾	Liverpool—Stockport	5	0 53	43	47	189	7.40, 9.0, 4.35 up; 9.55, 12.26 down
34¼	Manchester—L'rpool	1	0 45	45⅝	45⅝	34	9.35 P.M. *ex* Manchester
42¾	Liverpool—Marple	1	1 0	42⅝	45	43	12.15 up
166	St. Pancras—Buxton	1	4 15	39	43	166	12.25 down
	Total	32	averag.	42	45⅓	3,938	

EXPRESS SERVICE—*continued.*

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	Mileage	
				(*c*) *Scotch expresses.*			
310¼	St. Pancras—Carlisle	(5D) 9	H. M. 7 9	43⅔	47	2,792	5 run *viâ* Sheffield, 310 miles; 2 *viâ* Staveley, 308; 2 *viâ* Nottingham, 314
136	Liverpool—Carlisle	2	3 9	43	46⅔	272	2.50 down, 1.47 up
112¾	Leeds—Carlisle	2	2 54½	38¾	43½	225½	10.30 down, 8.10 up
35¼	Liverp'l—Blackburn.	8	0 48½	43½	45	282	worked by Mid. over L. & Y. Co.
188½	Derby—Carlisle	1	4 42	40	44	188½	8.0 P.M. *ex.* Bristol
86¾	Carlisle—Skipton	1	2 11	39¾	43⅔	87	5.45 P.M. up
198	St. Pancras—Leeds	1	5 0	39½	44	198	5.15 A.M. Newspaper
	Total	24	averag.	42½	46¼	4,045	
				(*d*) *Leeds—Bradford expresses.*			
204	St. Pancras—Leeds	(5U) 8	4 25	46	49	1,632	

Total for Midland.

	No.		Speed incl.	Speed excl.	Mileage
West of England expresses	17	av.	41¼	44⅓	1,167
Liverpool and Manchester expresses	32	,,	42	45½	3,938
Scotch expresses	24	,,	42½	46¼	4,045
Leeds and Bradford expresses	8	,,	46	49	1,632
	81	,,	42⅜	46¼	10,782
Add ⅓ of Cheshire Lines total (see p. 39)				47	599
				46¼	11,381

Comparing this total with those of the Great Northern and North-Western, and bearing in mind that the Midland engines have to face much the hardest gradients, there can be no doubt that this is, as it stands, the finest record in England. But, as we remarked before, since in so many cases the Midland does not observe punctuality, we hardly know what to say. Certainly the *journey-speeds*, *i.e.*, the speeds including stops, are not so good as they look on paper, for the journey so often takes longer than it is advertised to take. But the actual running-speeds, *i.e.*, the speeds *excluding* stops, are probably *greater* (because the trains are delayed at stations) than on paper. At any rate, the Midland engines perform wonderful feats of hauling heavy loads at high speeds up severe gradients; and a Midland express is rarely late from any fault of engine or driver.

But yet one other thing must be considered; these plucky high speeds on the Midland are very often performed with *two* engines, whereas the Great Northern scarcely ever (if ever), and the North-Western very rarely, deign to employ double engine power.

Besides the expresses given, there are these quick trains :—

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	
			H. M.			
66½	Barrow—Skipton .	1	1 49	36½	42½	1.18 from Barrow Docks
52½	Leicester—Peterboro' .	3	1 27	36	40	
42¼	Skipton—Morecambe .	4	1 11	35⅔	39⅔	
92½	Leeds—Barrow . .	1	2 37	35¼	39	11.0 boat train from Leeds
37¼	Peterboro'—Lynn .	4	1 4	35	39	Single line
16	Derby—Nottingham .	20	0 28	34⅓	38½	Very smart over short course
48¾	Manchester—Hellifield	8	1 26	34	39¼	Scotch expresses. Line very hilly
24½	Do. —Blackburn	2	0 45½	32⅓	36¼	Do.
33	Nottingham—Lincoln .		0 50	39½	41¼	Three days in the week
	Total . .	43				

BEST EXPRESSES.

1.

Miles		Time	Speed
		A.M.	
	St. Pancras .	10 30	52
99¼	Leicester .	12 25	
		29	49⅗
185¼	Normanton .	2 13	
		38	47
221¼	Skipton .	3 24	
	(Over a summit of 1,170 feet)	27	47⅘
308	Carlisle .	5 16	
	Glasgow, *arr.*	7 52	

Inclusive speed = 45½
Running average = 49⅖

This train was put on July 1888, and, unlike the best Scotch trains last summer of the North-Western or Great Northern, has maintained the same speed ever since.

2. *Edinburgh express.*

Miles		Time	Speed
		A.M.	
	St. Pancras .	10 40	51⅓
124	Nottingham .	1 5	
		9	49
204	Leeds . .	2 47	

Inclusive speed = 49½
Running average = 50⅓

This train is given only as far as *Leeds*, as a unique journey; after Leeds the speed is not so good, reaching Carlisle 5.47 and Edinburgh 8.24.

3.

Miles		Time	Speed
		P.M.	
	St. Pancras .	2 0	53
72¼	Kettering .	3 22	
		26	52⅗
124	Nottingham .	4 25	
		30	44⅘
171	Miller's Dale. (over 1,000 feet)	5 33	
		34	40¾
202¼	Manchester .	6 20	

Inclusive speed = 46⅔
Running average = 50½
The quickest train on the Midland.

4. *Cross country* (cf. p. 15.)

Miles		Time	Speed
		A.M.	
	Bristol . .	9 35	48¼
	(2 min. allowed for conditional stop at Mangotsfield.)		
37	Gloucester .	10 23	
		28	39
43½	Cheltenham .	10 38	
	2 miles up 1/37	40	43½
130½	Derby . .	12 40	
		45	39½
166¾	Sheffield .	1 40	
		45	45⅓
195½	Normanton .	2 23	

Inclusive speed = 40¾
Running average = 43⅖

Began Nov. 1888. Joins No. 1 at Normanton and No. 2 at Leeds.

This train runs past Birmingham without stopping. (See p. 16.)

BEST EXPRESSES—*continued.*

5.

Miles		Time	Speed
		A.M.	
	Manchester . . .	10 10	
62¾	Derby	11 35	44⅓
	Manchester . . .	12 0	
92	Leicester	1 59	46⅓

An ascent of $\frac{1}{90}$ from Manchester to the Peak Forest summit, 999 ft. above sea.

NORTH-WESTERN.

JUST as the Great Northern gains in smartness from being the youngest born of our (great) lines, so the North-Western, because it is the oldest, is more burdened with the traditions of a bygone age when 40 miles an hour was a wonderful speed. It is true that last summer it astonished the world by its brilliant burst in the 'race to Edinburgh,' and it is also true that since the Liverpool and Manchester trains were accelerated (4½ and 4¼ hours from London) the running of these south of Crewe is nearly as good as the best on other lines. But still, when we examine the figures in the following tables, we find that the *average* speed of its expresses comes some way behind that of its two great rivals. Of course there is a common-sense reason for this; namely, that as a rule the North-Western route to important towns is shorter—therefore demands less speed—than that by Great Northern or Midland,[1] and the North-Western is dignified enough to be content if it serves these towns as quickly as (instead of quicker than) its competitors. From *Liverpool* to London it cannot help being quicker, so much shorter is its route. Still, since we are here considering the question of mere speed, the fact remains that our 'leading line,' as many people love to call it, stands not at the head of the list, but sixth if we take the speed-including stops, and *fourth* if we go by 'running-average.' (See p. 66). The North-Western has a perfect permanent way, with very easy gradients (except between Preston and Carlisle), and Mr. Webb's superb 'compound' engines have lately been pouring out in quantities regardless of cost; the rolling-stock is probably the best in the kingdom; the company holds the preference share of our richest traffic, and its revenue is indeed 'princely.'[2] We merely remark that its average speed is not quite up to the level of all this

[1] Not to mention the 'Great Way Round' Company (G.W.R.).

[2] 11,000,000*l.* a year.

splendour and *prestige*.[1] Except in this one item, there is no doubt that the North-Western *is* 'the leading line.' And in the vital matter of *punctuality* this company easily carries off the prize; its arrivals are a lesson to the Midland or smaller delinquents north of Thames. (As for the Southern companies, they have a futile yearning after punctuality, but it is an aspiration towards an ideal which they do not hope to see realised in this world.) Hence, business people are strongly prejudiced in favour of the North-Western as against alternative routes; and in consequence its carriages are on the average more crowded than those of any other trunk line. North-Western porters and guards do their work with military precision, but with a finished nonchalance which is very appropriate to the oldest and most punctual of our great companies.

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	Mileage	
			H. M.				
	(a). Scotch Expresses.						
299½	Euston—Carlisle	(5u) 9	7 0	42¾	46½	2,695	During early August two others ran, averaging 7h. 10m.; also one from Manch. to Carlisle, 11.30 P.M.; and another Preston to Carlisle, 12.51 A.M.
90	Preston—Carlisle	1	1 53	48	48	90	2.47 P.M. *Glasgow* portion of 10 A.M. Euston
216¾	Carlisle—Rugby	1	5 30	39½	43	217	8.40 A.M., joining 12.0 *Manch.* at Rugby
105¼	Wigan—Carlisle	(2u) 3	2 46	38	41¼	316	Liverpool and Manch. trains
129	Carlisle—Liverpool	1	3 8	41	43	129	*viâ* Newton Bridge
124	Do. —Manchester	1	3 0	41½	43½	124	
69¼	Lancaster—Carlisle	1	1 45	39⅗	42⅖	69	
55	Birmingham—Crewe	(1u) 4	1 22	40¼	42	220	
152	Bristol—Crewe	Half the six Joint Severn Tunnel trains		38½	41	456	Since accelerated. (See p. 26)
		24		41	44⅝	4,316	
	(b). Irish Boat Trains.						
264	Euston—Holyhead	1	6 35	40	43⅔	264	These are the *North Wall* trains, only one is 'exp.' right through (6.30 P.M. down); the 'exp.' fragments of the others are given here
158–160	Do. —Crewe	2	3 52½	40¾	44	318	
85	Chester—Holyhead	4	2 10½	39	41	340	
264½	Euston—Do. (one runs *viâ* Northampton)	4	6 11½	42⅔	46	1,056	'Irish Mail,' 1st and 2nd cl. exp., fares; heavily subsidised by Govt.
	Total	11		40⅘	44⅖	1,978	

[1] Let anyone who wishes to have an idea of the resources possessed by the North-Western go and parade the platforms of Euston between 6 and 9 in the evenings of the first ten days of August; or let him examine the banks of the cutting at Roade.

EXPRESS SERVICE—*continued.*

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	Mileage	
			H. M.				
	(c). London and Liverpool—Manchester, &c.						
186¾	Euston—Manchester .	(5D) 12	4 17	43½	46¼	2,241	4 run *viâ* Stoke
193½	Do. —Liverpool .	2	4 50	40¼	44	387	12.10 down, 12 noon up
110¾	Rugby— Do. .	1	2 34	43	45½	111	Off 4.0 P.M. to Manchester
35¼	Crewe— Do. .	(3D) 7	0 53	40	42	247	
	Total . .	22		42	45⅜	2,986	
	(d). Through London—Birmingham expresses.						
115	Euston—Birmingham	(6D) 11	2 49	40½	44	1,265	All *viâ* Northampton except 4 P.M. up
	(e). Between Liverpool and Manchester.						
31½	Liverpool—Manchester	28	0 44¾	42¼	45	882	15 to Liverpool; 13 to Manchester. 6 take 40 min., 17 take 45, 1 takes 48, and 4 take 50 min.
	(f).						
56¼	Liverpool—Buxton .	2	1 20	42¼	44½	112½	8 miles of $\frac{1}{60}$ approaching Buxton up to a summit of 1,120 feet. Remarkably good speed
25	Manchester— Do. .	2	0 45	33⅓	35	50	
		4		37¾	41⅜	162½	
	(g). Miscellaneous: trains serving several towns.						
158–60	Crewe—Euston . .	(3U) 7	3 56	40⅖	44⅘	1,118	5 run *viâ* Northampton (160 miles)
84¾	Rugby— Do. .	2	2 6	40¼	43	169½	5 P.M. down, 7.32 P.M. up
65¾	Northampton—Euston	1	1 40	39½	43	66	7 55 A.M. up
51	Rugby—Peterborough	3	1 12½	42	43⅖	153	2 of these run G.E. carriages through between Birmingham and Harwich, to meet the Rotterdam or Antwerp steamers
		13		40⅝	44	1,506½	
	(h). Trains for North Wales, the Lakes, &c.						
160	Euston—Crewe . .	1	4 0	40	44	160	11.0 to Cambrian district
281½	Do. —Penrith .	1	6 55	40¾	44	281½	10.40 A.M.
260	Windermere—Euston.	1	6 35	39½	44	260	9.10 A.M. up
30	Stafford—Shrewsbury.	2	0 45	40	42	60	
72¾	Manchester—Rhyl. .	1	1 45	41⅖	44½	73	
30	Chester—Rhyl . .	14	0 41	44	44	420	
42¾	Manchester—Chester .	2	1 2½	41	42½	85½	
		22		42¾	43⅛	1,340	

(*o*). *Between Birmingham and Manchester* } *The North-Western has*
„ Manchester „ Leeds } *not one 'exp.' journey.*

Miles	Between		
84	Birmingham—Manch.	quickest takes 2 15 = 37½ incl. speed	11.50, 3.0, 5.40 D.
42¾	Manchester—Leeds	„ „ 1 13 = 35 „ „	12.15 *ex.* Manch.

This is one of those paradoxical results with which English railway statistics so often surprise us : just where we should have expected quick communication we do not find it. The Leeds route is rather steep (over 645 feet), and passes through a host of junctions, but Manchester to *Sheffield* (41 miles) is run within the hour, over a summit of 1,000 feet. However, the North-Western can take it easy to Leeds, because the competitive route—by the L. & Y.—is so much longer.

Adding together these batches we have :—

	No.	Speed		Miles
		incl.	excl.	
Scotch expresses	24	41	$44\frac{5}{21}$	4,316
Irish do.	11	$40\frac{4}{5}$	$44\frac{3}{5}$	1,978
London—Lancashire. . . .	22	42	$45\frac{3}{5}$	2,986
Do. —Birmingham . . .	11	$40\frac{1}{2}$	44	1,265
Liverpool—Manchester . . .	28	$42\frac{1}{4}$	45	882
Buxton—Liverpool and Manchester .	4	$37\frac{3}{4}$	$41\frac{3}{4}$	$162\frac{1}{2}$
London—N. Wales, Lakes, &c. . .	22	$42\frac{3}{4}$	$43\frac{4}{5}$	1,340
Miscellaneous	13	$40\frac{5}{6}$	44	$1,506\frac{1}{2}$
Total expresses . . .	135	$41\frac{1}{2}$	$44\frac{2}{3}$	14,436

All this mileage is 3rd class, except 877 miles (Irish mails).

Though this running-average does not dazzle us after the Midland or Great Northern, still the result is admirable. This one English railway gives us an amount of speed exceeding 40 miles an hour greater than that contributed by the entire continent of Europe or the whole of the United States.

Another pleasant feature is that the North-Western is at present improving very much in speed. In the 'race to Edinburgh' this dignified corporation started up with the animation of a schoolboy ; and it seems by no means loth to run at any speed required in order to keep level with the longer routes of its rivals. It lets the others 'make the running,' but it 'breasts the tape' simultaneously with them. By its possession of so many of the shortest routes it holds the trumps, and can if it please spoil nearly all its adversaries' tricks. But it does not believe in Gargantuan competition, and exhibits few of the mean traits of nineteenth-century commercialism.

BEST EXPRESSES.

Miles		Time	Speed
		A.M.	
	Euston . .	10 0	
158¼	Crewe . .	1 0	52¾
		5	
209¼	Preston. .	2 3	52¾
		23	
299½	Carlisle. .	4 3	54
	Edin. *arr.* .	6 0	

Inclusive speed = 50
Running average = 53⅓

Another paradox here; between Preston and Carlisle, having to climb steeply over a summit of 920 feet, they run faster than on the easy stretch to Crewe

This train ran from August 6, 1888 to the end of the month, since which it has been reduced in speed to reach Carlisle 4.27, and Edinburgh 6.30.

During August it generally ran under its time, sometimes much under. On the 13th it reached Carlisle at 3.46.

Miles		Time	Speed
		A.M.	
	Euston . .	7 15	
46¼	Bletchley .	8 14	47
		16	
82¾	Rugby . .	9 0	49¾
		5	
158¼	Crewe . .	10 45	45⅓
		55	
179	Chester. .	11 23	44½
		33	
264	Holyhead .	1 20	47⅔

Inclusive speed = 43⅖
Running average = 47
'Wild Irishman' (1 & 2 class).

Miles		Time	Speed
		P.M.	
	Euston . .	2 0	
5½	Willesden .	2 9	36⅔
		11	
82¾	Rugby . .	3 44	50
		48	
158¼	Crewe . .	5 21	48⅔
	(Conditional stop at Alderley Edge.)		
		25	
184¼	Stockport .	6 0	44½
		3	
189	Manchester .	6 15	24

Inclusive speed = 44½
Running average = 47¼

Compare this last with the Great Northern rival train and Midland.

Miles		Time	Speed
		P.M.	
	King's Cross.	2 0	
105⅜	Grantham .	3 59	53
		4 4	
162	Sheffield .	5 12	50
	(over 1,015 feet)	16	
203	Manchester .	6 15	41⅔

Inclusive speed = 47¾
Running average = 49½

	Time	Speed
	P.M.	
St. Pancras .	2 0	
Manchester .	6 20	50½

See p. 10.

Runs over a summit of 1,000 feet.

If we want proofs of the energy with which *local* services are worked in England, let us take three instances on the L. & N.W.R.

From Craven Arms to Swansea is 95½ miles of hilly single line. Yet we have four trains doing the journey in 3 hours 40 minutes, over 26 miles an hour including stops, of which there are from *fifteen* to *twenty*.

From Bedford to Cambridge, again, is 29¾ miles, partly single ; yet one train covers the distance in 56 minutes, more than Continental express speed, though making *seven* stops, and all five trains in the opposite direction average only 1 hour 1 minute.

From Oxford to Bletchley, 31½ miles, a train with two stops takes exactly one hour ; while in the opposite direction a train with three stops only takes 55 minutes, 34⅓ miles inclusive. Yet cavillers at our system say that our cross-country services in England are neglected for through traffic, the fact being that we go nearly twice as fast across country in England as in Germany.

(Again, on the Great Northern, several local trains daily run from Hitchin to Cambridge, 26 miles, in 53 minutes, or at 29½ miles an hour, notwithstanding *seven* stops and one slackening.)

Birmingham is the unfortunate town on the North-Western system. Once it enjoyed the full blaze of railway speed ; now it is left out in the cold, on a neglected 'siding.' The North-Western arterial trains forget all about it as they sweep along the direct route of the Trent Valley, while the Midland (*et tu, Brute !*) actually runs its best express from Bristol clean past the big town—perhaps the only instance of an express 'cutting' a population of half a million.[1] We have already referred to the extraordinary fact that there is not one single 'express' train run by the North-Western between Birmingham and Manchester or Liverpool—a result due, of course, to the absence of effective competition over the longer route of the Midland. But, though standing low in the list as regards express facilities, Birmingham can (and does) boast the largest railway station in England—perhaps in the world, excepting the new one at Frankfort-on-Main and the magnificent one at Amsterdam. Still, the station is more imposing than the services that issue from its roof, and, considering that Birmingham is traversed by the main lines of three competing companies, it is wonderful that the express programme is so poor ; however, the natives are content, and so matters are not likely to improve.

We insert here a short account of the 'race to Edinburgh' which took place during August 1888. It is taken from the pages of the *Pall Mall Gazette* 'Extra' of September 6, 1888.

'This summer the three great lines that start from Euston, St.

[1] In this case, however, the Midland gives Birmingham a wide berth in order to avoid being robbed of its passengers. If this Scotch express stopped at New Street, the passengers might get out and go on by North-Western, reaching Edinburgh 6.30, and Glasgow 7.0 ; while the Midland, having so much longer a route, cannot land them there before 8.24 and 7.50 respectively. It therefore shuts them in at Cheltenham, and hurries ahead 87 miles without stopping, to Derby. (See p. 10.)

Pancras, and King's Cross have with one consent determined to beat their own record to an extent that is astounding. The movement had its origin unnoticed last November, and it culminated early this August in the exciting "race to Edinburgh," during which the daily performance of each of the rival expresses was minutely wired to the morning papers.

'*Origin of the "Race."*—In November 1887 the Great Northern advertised that henceforth it would carry *third class* passengers in its ten o'clock trains between London and Scotland. These two expresses had previously been confined to first and second class only, occupying 9 hours between King's Cross and Edinburgh, and 10 hours 20 minutes between King's Cross and Glasgow. Now the North-Western best expresses had for some years been third class, and took 10 hours (sometimes $9\frac{3}{4}$) for either Edinburgh or Glasgow. But the quickest *third class* day express on the Great Northern (10.35) took also 10 hours to Edinburgh, and nearly 12 to Glasgow. Consequently up to last November the state of affairs was this, that the Great Northern had the bulk of first and second class traffic to Edinburgh, while the North-Western got nearly all the (first, second, and third class) passengers for Glasgow, and competed on equal terms with the Great Northern for third class Edinburgh traffic. After November, however, third class passengers could arrive in Edinburgh one hour sooner by the Great Northern than by the North-Western, and would reach Glasgow only a little later (8.20 P.M. against 8 P.M.). Thus the North-Western found an ebbing tide of third class through traffic—and though the fire of competition was kept smouldering all the winter months, it soon burst out with the arrival of summer and the tourist season.

'*June* 2 : *Acceleration No.* 1.—Towards the close of May the North-Western announced that from June 2 its 10 o'clock expresses up and down would do the journey between Glasgow or Edinburgh and Euston in nine instead of the old ten hours, *i.e.* in the same time as the Great Northern (both being now alike third class). This was *Acceleration No.* 1. Concurrently with this they put on a new express for *Perth*, leaving Euston at 10.30, arriving at Perth 9.35, twenty minutes quicker than before. Admirers of speed were pleased at these signs of youthful energy on the part of an old established line hitherto content to work its services at a speed less brilliant than either of its two rivals. They also sniffed the air of battle—for railways do not turn the other cheek when struck.

'*July* 1 : *Acceleration No.* 2.—And June was not far gone before the Great Northern gave notice that from July 1 the East Coast companies would shorten their Edinburgh and Glasgow journeys by half an hour both ways, making the time for Edinburgh $8\frac{1}{2}$ hours, for Glasgow 9 hours 50 minutes. This was *Acceleration No.* 2.

The Midland on their part promised to knock a whole hour off their quickest time to Glasgow, 25 minutes off that to Edinburgh (for the London traffic of which they do not seriously compete), reaching Glasgow from St. Pancras in 9 hours 20 minutes (20 minutes longer than the North-Western, whose route is 22 miles shorter), and Edinburgh in 9¾ hours. The North-Western made no alteration as to their new nine-hour expresses; but they quickened by 40 minutes the *Perth* express put on in June, letting it reach Perth at 8.45, or 70 minutes faster than it was in May.

'Thus the companies entered on July with the Great Northern ½ hour ahead of the North-Western to Edinburgh, the North-Western beating both rivals to Glasgow, the Midland by 20 minutes, the Great Northern by 50 minutes. Throughout July this programme worked unaltered, the rival trains running as below (each company having exactly similar trains on the *up* journey):—

BEST SCOTCH EXPRESSES. July 1–31, 1888.

West Coast Route.

	A.M.		P.M.
Euston	10 0	Preston	2 22
Willesden	10 9		47
	11	Carlisle	4 40
Rugby	11 42		47
	47	(Carstairs—train divided.)	
Crewe	1 15	Edinburgh	7 0
	22	Glasgow	7 0

After Aug. 6, when the eight-hour Edinburgh express began, the above train was retained for Glasgow passengers, leaving Euston at 10.3, and falling into the above times from Rugby. For speed, &c., see p. 23.

East Coast Route.

	A.M.		P.M.
King's Cross	10 0	Berwick, *dep.*	5 13
Grantham	12 4	Edinburgh	6 30
	9		40
York	1 45	Polmont	7 10
	2 5		11
Newcastle	3 42	Cowlairs	7 42
	47		45
Berwick, *arr.*	5 8	Glasgow	7 50

After Aug. 1, when the eight-hour Edinburgh express began, this train continued for Glasgow passengers, leaving King's Cross 10.5, Grantham arr. 12.7, dep. 12.12, falling in with the above times at York. For speed, &c., see p. 24.

Midland Route.

	A.M.		A.M.
St. Pancras	10 30	St. Pancras	10 40
Glasgow	7 52	Edinburgh	8 24

These trains have remained unaltered since July 1. For speed, &c. see p. 23.

'*August* 1: *Acceleration No.* 3.—Now comes the startling *Acceleration No.* 3. On July 27 the North-Western, contrary to all tradition, sprang a surprise by abruptly announcing that from August 1

they too would run to *Edinburgh* in 8½ hours. (No need to accelerate their *Glasgow* train, because of the so much longer East Coast route to Glasgow.) They probably thought that by taking this move at the eleventh hour they would "do" the Great Northern, as there would not be time for the latter company to arrange reprisals. The Great Northern, however, promptly returned the service, and in a few hours had issued its working notices all over the line to announce that from August 1 they, with the North-Eastern, would undertake the run in *eight* hours. The Midland, recognising the impossibility of further competition, with their unpropitious route, stuck to their programme of July. These last four days of July were a stirring time for the "Office of Superintendent of the Line" at King's Cross and Euston. It requires a railway training to contemplate with a cool head the urgent introduction of "accelerations" like these, involving special "shunts" and signal-box instructions all along the route—these to be rapidly arranged in the very busiest week of the railway year. Hence people who would themselves have been driven wild by such responsibility rushed to the papers with forcible feeble remonstrances against the "danger" incurred.

'Thus by August 1 public interest in these trains was thoroughly aroused, and the "race to Edinburgh" common talk. On that day the Great Northern opened its 8-hour programme. It divided the 10 o'clock train, starting the Edinburgh passengers (8 carriages) first by themselves, while those for Glasgow followed at 10.5, reaching (Edinburgh at 6.30 and) Glasgow at 7.50, as in July. The North-Western, having fewer Edinburgh passengers, ran these together with the Glasgow ones as far as Preston, whence each portion pursued its journey separate over the hills. Both West and East Coast trains arrived in Edinburgh before their time. This phase of the "race," which only lasted four days, read thus:—

West Coast.

August 1–4 inclusive.

	A.M.		
Euston	10 0		
Willesden	10 9		
	11		
Rugby	11 42		
	47		
Crewe	1 15		
	22		
Preston	2 22		P.M.
	42	Preston	2 47
Carlisle	4 27	Carlisle	4 40
	32		47
Edinburgh	6 30	Glasgow	7 0

East Coast.

August 1–11.

	A.M.		A.M.
King's Cross	10 0	King's Cross	10 5
Grantham	11 57	Grantham	12 7
	12 2		12
York	1 30	York	1 45
	50		2 5
Newcastle	3 23	Newcastle	3 42
	28		47
Berwick	4 44	Berwick	5 8
	49		13
Edinburgh	6 0	Edinburgh	6 30
			40
		Polmont	7 10
			11
		Cowlairs	7 42
			45
		Glasgow	7 50

This train was timed to reach York at 1.35 for the first two days, then 1.32, then 1.30.

As in July, except starting 5 min. later.

'*August* 6: *Acceleration No.* 4.—But the sky was not clear of thunder. The North-Western, finding they ran over Shap easily in the shortened time (at 51½ miles an hour), and the Caledonian still more easily (50 miles an hour), gave notice on the 3rd that, beginning on August 6, they would run their Edinburgh train separate throughout, and that it should reach Edinburgh in 8 hours, like the East Coast. Here was *Acceleration No.* 4, the most dramatic of the lot, for now we had the novelty of an equal time by either route. This dead heat lasted one week, August 6 to 11 inclusive—the Midland meanwhile, in spite of its own acceleration of 23 minutes to Edinburgh compared with last year, having now dropped 1¾ hour behind its rivals, so far had the other two shot ahead. This was the week of the real "race," for to convince each other that fighting was futile both West and East Coast ran every day within the time. On the opening day indeed the West Coast train saved 15 minutes on the road, and arrived at Edinburgh at 5.52. A column was wired to the *Times* that night describing the run in detail, and a full account was cabled to the *New York Herald.* More striking even than the unprecedented run without a stop to Crewe, 158 miles, was the ease with which the engines sped over Shap and Beattock summit, for it was on these mountain sections that most time was saved. On the 7th the West Coast train did the 90 miles from Preston to Carlisle (over 920 feet) in 89 minutes. On the 9th it burst a boiler-tube and was delayed at Shap.

'*August* 13: *5th and last Acceleration.*—The East Coast too in a less exciting way had been running under time, so on the 10th they gave official notice that from Monday August 13 to the end of the month the train should be timed to arrive in Edinburgh at 5.45, or

7¾ hours from King's Cross—the 5th and last acceleration. The new quarter of an hour was to be saved by taking out the stop at Berwick, and by quicker running North of York.

'*Climax.*—Of course—having done it already—the North-Western cheerfully prepared to follow suit. August 13, therefore, saw the climax of this race: on that day the West Coast train (the East Coast got in late, because of wind) ran to Edinburgh in 7 hours 38 minutes. Next day, the 14th, the East Coast train got to Edinburgh in 7 hours 32 minutes, 6 minutes less, but 8 miles shorter. On this day the contest suddenly subsided: both combatants having now sufficiently shown what they could do, a conference was held, and it was arranged that the West Coast should relapse to its Bank Holiday programme of 8 hours, while the East Coast should continue till the end of August at 7¾ hours.

'*Last day of August.*—On the 31st the display of fireworks closed with a brilliant burst on the East Coast route. The following is the account of a passenger by the train:—

'To-day saw the last of those famous runs to Edinburgh for which the August of 1888 will be long remembered. Since the 14th the West Coast had kindly agreed to give up forcing the pace, and actual "racing" had therefore ceased. But speed had not; for the drivers kept up the sport throughout the rest of the month. On the 28th the East Coast reached Edinburgh at 5.29, three minutes sooner than the previous best record of August 14.

'To-day, however, being the farewell performance, we had to cap the feat of the 28th, and we did it very pleasantly. Our train of seven carriages drew smartly up at the Waverley platform at 5.27. A crowd at once surrounded the engine, No. 117, one of Mr. Worsdell's new compounds, and the driver was besieged with many a query while he stroked his engine here and there. We had been stopped 2 minutes at Selby (for the drawbridge), we had stayed 26½ instead of our proper 20 minutes at York, and again we had been stopped dead for a minute and a half outside Ferry Hill, besides two other slackenings for signals; yet we managed to arrive at 5.27, instead of our supposed 5.45. After the Ferry Hill check our driver flew in elegant style past Chester-le-Street, where 4 successive miles were done in 47½, 47¼, 47, 47 seconds—a speed of 76½ miles an hour. This was the quickest bit on the trip, but several miles were run in 48 and 49 seconds. North of Darlington much wayside interest was taken in our course, many grins and salutes being waved from spinning platforms.

'It is a curious experience to have afternoon tea in one's hotel here, and then be standing on the Calton Hill looking at the Forth Bridge at six o'clock, having left King's Cross at ten. We give the log of this last August run:—

Miles	Run on August 31, 1888		Time	Speed
			A.M.	
	King's Cross . . .	dep.	10 0	57½ checked 2 miles S. of Peterboro'
76¼	Peterborough . . .	pass	11 17	
105⅜	Grantham . . .	arr.	11 50	
		dep.	54¾	56½ including stop, &c.
	Selby, checked and stopped 2 minutes			
187⅞	York . . .	arr.	1 22½	
		dep.	49	58 including stop, &c.
	Ferry Hill, stopped 1½ minute			
268½	Newcastle . . .	arr.	3 12¼	
		dep.	17	
335	Berwick . . .	pass	4 26	57⅓
392½	Edinburgh . . .	arr.	5 26¾	

'Some people pretend to despise this racing speed; it is difficult to do so—at any rate within twenty-four hours of the actual experience.[1]

'*The Reason of the Race.*—Whence this new ardour, it has been asked, on the part of the North-Western to reach Edinburgh (for nothing has happened to the Glasgow trains since the initial acceleration of the L.N.W. on June 2 and the response of the G.N. and Midland on July 1) in the same time as the Great Northern? The new motive came in last autumn when the Great Northern admitted third class passengers to its nine-hour trains, for until then

[1] *Engines used in the August 'race.'*—The North-Western used on the section S. of Crewe engines of the 'Lady of the Lake' class, originally built by Mr. Ramsbottom, one of which gained first prize in the Exhibition of 1862. These have 7ft. 6 single drivers, and 'outside' cylinders 16 in. diameter, with 24 in. stroke. In January 1862 one of this class brought the 'Trent' dispatches from Holyhead to Euston in 5 hours—264 miles. It ran without a stop frem Holyhead to Stafford (130½ miles) at the rate of 54 miles an hour. Between Crewe and Carlisle the engines used were of the 'Precedent' class, with coupled drivers.

The Great Northern between King's Cross and York ran their usual 8-foot 'singles.'

The North-Eastern between York and Edinburgh tried the new Worsdell compounds as well as their ordinary express engines; both of these have coupled drivers. The best runs were those described above on August 31 (for the run on the 14th from Newcastle to Edinburgh in 124 minutes was done with *two* engines), the one from York to Newcastle being done by the ordinary express engine, that from Newcastle to Edinburgh with a compound.

The Caledonian have used their new express engines with 7-foot 'single' drivers; hence their success over such hills has been the most remarkable.

Thus both old and new engines have been tried, and one class has succeeded as much as the other. Only it must be remembered that the 'race' was run with very (from a modern standard) light trains, for which these older types of engines were well suited. Our modern express engines, on the other hand, are incomparably superior to those old engines in the dragging at high speed of the very heavy modern loads which they are designed to pull. To put them on these light Edinburgh trains gave them no occasion for proving their proper merits. Thus, as a matter of fact, with the light load all the six sorts of engines used seemed with equal ease to attain well over 60 miles an hour. With a heavy load the older class of engine would have been nowhere, and the compounds would have been under 60 miles on hour.

the third class (day) journey by the East Coast route had occupied ten hours, just the same as by the West Coast. Still, apart from this provoking incident, the battle must have burst out soon. The main cause confronts us when we see those three stupendous towers of steel which loom above the horizon of Edinburgh. When the Forth Bridge is finished the North-Western and Caledonian will have to struggle hard if they wish to retain much of the traffic to Dundee or Aberdeen, and may possibly be robbed of some of that to Inverness. Hence the combatants are having trial heats to nerve themselves for the inevitable fight.

'*The Log of the Edinburgh Expresses.*—Having calmed down from the perusal of this "race," let us examine the great Scotch expresses of the three companies as they finally remained during the truce of August, 1888 (14th–31st) :—

West Coast Route. August 14–31, 1888.

Miles		Time	Speed	
		A.M.		
	Euston .	10 0		
158¼	Crewe .	1 0	52¾	L.N.W.
		1 5		
209¼	Preston .	2 3	52¾	
	(over 920 ft.)	2 23		
299½	Carlisle .	4 3	54	
	(over 1,015 ft.)	4 8		
400¼	Edinburgh	6 0	54	Cal.

Inclusive speed = 50
Running average = 53⅓

Miles		Time	Speed	
		A.M.		
	Euston .	10 3		
5½	Willesden .	10 12	52⅔	
		10 14		
82¾	Rugby .	11 42		L.N.W.
		11 47		
158¼	Crewe .	1 15	51½	
		1 22		
209¼	Preston .	2 22	51	
		2 47		
299½	Carlisle .	4 40	48	
		4 47		Cal.
401½	Glasgow .	7 0	46	

Incl. speed = 45. Running average = 49

Midland Route. Unaltered since July 1.

Miles		Time	Speed	
		A.M.		
	St. Pancras.	10 40		
124	Nottingham	1 5	51⅓	
		1 9		
202	Leeds . .	2 47	47¾	
		3 12		Mid.
238¼	Hellifield .	4 6	40¼	
		4 10		
314¾	Carlisle .	5 47	47⅓	
		5 54		
360	Hawick .	6 58	42⅜	
		7 0		
	(Melrose conditional stop)		37¾ –42	N.B.
379⅓	Galashiels .	7 31		
		7 34		
413	Edinburgh .	8 24	40½	

Incl. speed = 42⅔. Running av. = 46¼

Miles		Time	Speed	
		A.M.		
	St. Pancras	10 30		
99¼	Leicester .	12 25	51⅘	
		12 29		
185¼	Normanton	2 13	49⅖	
		2 38		Mid.
221	Skipton .	3 24	46⅔	
		3 27		
307¾	Carlisle .	5 16	47¾	
		5 21		
340¾	Dumfries .	6 0	50¾	
		6 3		G.& S.W.
399¼	Kilmarnock	7 15	48¾	
		7 19		
423	Glasgow .	7 52	43⅕	

Inclusive speed = 45
Running average = 49

East Coast Route.

Miles		Time	Speed	
		A.M.		
	King's Cross	10 0	54	G.N.
105⅜	Grantham .	11 57		
		12 2	56¼	
187⅞	York . .	1 30		
		1 50	52	N.E.
268½	Newcastle .	3 23		
		3 28	54⅓	
392½	Edinburgh	5 45		

Inclusive speed = 50⅔
Running average = 54

Miles		Time	Speed	
		A.M.		
	King's Cross	10 5	51⅝	G.N.
105⅜	Grantham .	12 7		
		12 12	53¼	
187⅞	York . .	1 45		
		2 5	50	N.E.
268½	Newcastle .	3 42		
		3 47	49¼	
335	Berwick .	5 8		
		5 13	44⅘	
392½	Edinburgh .	6 30		
		6 40	44½	N.B.
414¾	Polmont .	7 10		
		7 11	45½	
438¼	Cowlairs .	7 42		
		7 45		
439¾	Glasgow .	7 50		

Incl. speed = 45. Running average = 49¼

'Each company, we see, was obliged to take its Edinburgh passengers alone in separate trains throughout. (It will be noticed as a curious coincidence that both the inclusive and the net speeds are just the same by each of the Glasgow trains.)

'*Some Striking Records.*—This is a pretty good broadside of unexampled speed to be discharged from one spot of London within three-quarters of an hour—not to mention the fact that within the same time the Great Northern was despatching four more expresses to the north, and the North-Western three. Before relinquishing the "race," however, the West Coast Company left us these records of a speed still higher than the above: Crewe to Preston was done one day in 50 minutes, 51 miles; Preston to Carlisle in 89 minutes, 90 miles; and Carlisle to Edinburgh in 102½ minutes, 100¾ miles. So smooth was the motion that the unsuspecting passengers were unaware they were taking part in a feat that would have been on level ground without a precedent, and over summits of a thousand feet superb. The East Coast on the 14th August, its last racing day, did an equally remarkable exploit, running (with two engines) from Newcastle to Edinburgh in 124 minutes, a distance of 124 miles. The course is much easier than from Preston to Edinburgh, but the train a good bit heavier than on the West Coast route. On August 28 the East Coast reached Edinburgh at 5.29, three minutes faster than on the 14th. The N.E.R. used their ordinary, not their compound, engine, on this occasion.

'In August, 1888, the three companies together had twenty-nine trains (counting both ways, but not including the short-lived "grouse-trains") between London and Scotland which were really "express,"

i.e., which satisfied the exacting standard of "forty miles an hour, stops included." In the summer of 1885 there were nineteen, and in 1883 there were sixteen. Besides these are six more real expresses between Lancashire and Scotland, and a dozen others between London and Scotland which miss the proud title only by stopping oftener. Not only is there this increase of fifty per cent. in the number of Scotch expresses since 1883, but their average speed has risen too. The twenty-nine "express" journeys of this summer average a quarter of an hour less than the nineteen of 1885, and half an hour less than the sixteen of 1883. We are here not counting the new expresses from Bristol viâ Severn Tunnel, which we come to later. Such is five years' progress, as persistent as the "depression of trade" during which it has occurred.

'A foreigner taken on to the midnight platform at Shap in the earlier nights of August would have been surprised to see *five* expresses roaring through within two hours, one laden with "Horses and Carriages only," another full of beds and lucky people whose rest the North-Western will not allow to be broken by the entry of a single passenger between Euston and Perth, all five steaming without a stop the ninety miles from Preston to Carlisle, except one (from Liverpool and Manchester) which takes the 105 from Wigan in a breath. Down the adjacent Eden valley he might almost have heard the *three* Midland night expresses, sweeping two without a stop from Skipton to Carlisle, one in a longer burst of ninety-six miles from Keighley. Away on the East coast *five* Great Northern trains would be doing similar deeds, two from York to Newcastle (80 miles) without a stop, all five from Newcastle to Berwick (66 miles), and two of them without a pause from Newcastle to Edinburgh, 124 miles. Still more incredulous would our visitor have been when told that these were not *luxe* or "limited" trains with extra fancy fares, but that all alike conveyed the common third class traveller.

'*Factors in Comparisons.*—In dilating on the speeds of these new Scotch expresses we wish to give a wide berth to that odious habit of trying to set one favourite company on a peerless pinnacle of its own by means of dishonest depreciation of its rivals. The three great lines that start from London for the North are too first-rate in every way for such vulgar and petty comparisons. Any other country would be proud to possess either one of them; all three are ours. Besides, for an honest comparison of rival trains many considerations have to be carefully combined. Speed is not everything, and even speed must be judged according to the toughness of the obstacles over which it triumphs. To begin with, the weight of what is dragged at this whirlwind pace. At extreme speeds such as we have chronicled every extra ton (much more every extra

carriage) is an important factor in the result. Now the West Coast train throughout the race was unquestionably the lighter of the two; and the Midland was heavier again than the East Coast. But gradients are an equally vital element in the comparison. Here the East Coast have distinctly the easy route, while the West Coast have a decided advantage (especially South of Crewe) over the Midland, whose line is hilly from end to end.'

GREAT WESTERN.

THIS is the largest English line as regards extent in miles,[1] and the second largest in regard to traffic. But its proportion of express-running is still very unsatisfactory. The greater part of its three main routes is blessed with extremely easy gradients, hence the speed of its best trains is very high; and, as there are so few of these quick trains, they are particularly crowded. From time to time as years pass on, this company with timorous hand adventures on a new express, which is instantly filled; yet they will not try the experiment on a bolder scale, and face their rivals with a serious express programme. However, during the last thirty years, the history of the Great Western has been one continuous ascent towards financial prosperity, and, now that its fortunes are consolidated, it will perhaps wake up to a sense of its position, and determine to give the public no more doles, but an express service organised and

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	Mileage	
			H. M.				
246¾	London—Plymouth .	6	6 13	40	44	1,480	four of these '1st & 2nd only'
118½	Do. —Bristol . .	(2U) 3	2 53	41	45¼	356	6.20 down; 7.50, 9.35 A.M. up
228¾	Do. —Birkenhead .	2	5 22	42⅓	45¾	457	
171⅓	Do. —Shrewsbury .	(D) 1	4 8	41⅓	44	172	9.55 A.M.
141¾	Do. —Wolverhampton	(U) 1	3 20	42⅔	44	142	7.5 A.M. up
129¼	Do. —Birmingham .	(D) 1	3 18	39	42	129	6.30 P.M.—barely 'exp.'
120¾	Do. —Worcester .	(U) 1	3 0	40¼	43	121	2.15 P.M. up
158½	Do. —Newport .	2	3 58½	40	43⅔	317	
152	Bristol—Crewe[2] . .	6	3 58	58½	41	456	Mileage divided between G.W. and L.N.W. see p. 12
	Total .	23		40	43⅝	3,630	

[1] Since the recent purchase of the Cornwall Railway (in Nov. 1888) the G.W.R. administers a system of 2,460 miles, 600 more than the L. & N.W.

[2] Accelerated in Oct. The six now average 3.55.

worthy of the largest line in the kingdom. It is in many ways such a great line that its meanness in the matter of quick trains is the more incongruous; thus twenty years ago its Exeter expresses ran at the same speed as now—only a shade slower than the quickest Great Northern run to-day; and again, no company has anything to be so proud of as the Severn Tunnel. The Great Western is a very solid line, and makes it progress in a stolid style: doing some great things and many small, but all alike with the immovability of Jove.

The above trains are 'all third class, with the exception of the (four) fast Exeter expresses'; but then the total 'express' mileage is so small that this exception knocks off 25 per cent. These four trains (known as the 'Dutchman' and 'Zulu') have an average speed, excluding stops, of 50 miles an hour between London and Exeter, and on the strength of this one instalment of really fine speed the Great Western for years enjoyed a reputation much above its merits. The Great Northern, on a system one-third the size of the Great Western, gives us four times as much mileage above 50 miles an hour—that is, *twelve times* the proportion of choice speed, and all third class, over a hillier line.

G. W. FAST TRAINS.

Miles	Between	No.	Av. time	Incl. speed	
			H. M.		
194	London—Exeter .	6	5 20	36½	3,036 miles of discreditable speed, which such a great company should at once raise to express standard
141¾	Do. Wolverhampton	4	3 53	36½	
285½	Do. Milford . .	2	8 8	35	
57¼	Oxford—Worcester .	2	1 34	37½	
127	Milford—Newport .	2	4 1½	31⅝	
91½	Swindon—Weymouth	4	2 54	31½	
		20	averaging	35	

We have overstepped our province to insert the last six trains, because the company for some subtle reason calls them Milford and Weymouth 'expresses.' Their notion seems to be that, so long as they convey Weymouth or Milford passengers at high speed over the Swindon-Paddington section, the entire journey must be counted express; but one touch of high speed does *not* make the whole run 'express.'

Reckoning bits about 40 miles and over run by fast trains at over 40 miles an hour, we have a secondary 'express' mileage of 274 miles at 43 miles an hour (see note p. 35); thus the total for the Great Western Railway is :—

		Excl. speed
23 expresses, contributing . . .	3,630 miles at	43⅝
Runs off fast trains	274 „	43
	3,904 „	43¾

The great Brunel might turn in his grave at this result, so poor in comparison with what the northern lines present, so altogether unworthy of the history and present position of his big line.

It should be noted that the 'inclusive speed' of trains on the Great Western Railway is lessened by the obligation to pause ten minutes at Swindon, an obligation from which the refreshment

BEST EXPRESSES.

Broad Gauge (1 & 2 cl.).

Miles		Time	Speed	Miles		Time	Speed
		A.M.				P.M.	
	Penzance .	11 15	} 30		North Road .	2 15	} 30
2	Marazion Rd.	11 19		81	Mutley . .	2 16	
		20	} 32			17	} 35
5¾	St. Erth .	11 27		112½	Newton Abbot	3 11	
		29	} 29			15	} 35
13	Camborne .	11 44		117¾	Teignmouth .	3 24	
		46	} 34⅓			28	} 40¼
17	Redruth .	11 53		132½	Exeter . .	3 50	
		57	} 26¼			55	} 48½
25¾	Truro . .	12 17		163¼	Taunton .	4 33	
		23	} 33½			37	} 51⅔
40¼	St. Austell .	12 49		208	Bristol . .	5 29	
		51	} 38⅔			34	} 44
52½	Bodmin Rd. .	1 10		219¾	Bath . .	5 50	
		12	} 34¾			53	} 45⅜
61¾	Liskeard .	1 28		249¼	Swindon .	6 32	
		31	} 36⅔			42	} 52⅔
78¼	Devonport .	1 58		326½	Paddington .	8 10	
		2 2	} 33¾				
80½	North Road .	2 6					

Inclusive speed = 36⅗ } from Penzance to Paddington
Running average = 42¼ }
Inclusive speed = 29 }
Running average = 34⅖ } „ „ Exeter[1]
Inclusive speed = 45⅔ }
Running average = 50 } „ Exeter to Paddington

Narrow Gauge.

Miles		Time	Speed	Miles		Time	Speed
		P.M.				P.M.	
	Paddington .	4 45	} 48·85		Wellington .	8 21	} 41
63½	Oxford . .	6 3		171½	Shrewsbury .	8 36	
		8	} 50			39	} 50⅔
129¼	Birmingham .	7 27		213¾	Chester . .	9 29	
		30	} 39½		(cutting)	31	} 40¼
141¾	Wolverhampt'n	7 49		228½	Birkenhead .	9 53	
		52	} 45				
161¼	Wellington .	8 18					

Inclusive speed = 44½ Running average = 47⅞

[1] As fast as a Continental 'express,' though this section consists chiefly of gradients of 1 in 40 alternating with sharp curves, and is partly single line.

proprietors will not free the company until the year 1940. At the same time the exceptionally level character of their line sets off this disadvantage.

If the Great Western were aggressive or energetic like other lines, it would see plenty of fresh enterprise lying ready to its hand. There is no reason why, if it ran more expresses to the North, it should not secure a more equal share of traffic between London and Birkenhead, while the same venture would yield a similar increase as regards Birmingham, Wolverhampton, &c. And now that it has the stimulus accruing from joint mileage over the 'Severn Tunnel route to the North,' might it not re-establish under happier auspices the service lapsed between Weymouth and Cherbourg? Then the 'Irish boat trains' should be promptly accelerated to do the journey between Milford and London in 7 hours (which would be only 40 miles an hour), not merely for the sake of more tourists in summer, but in deference to neglected Swansea, if not with an eye to the development of future 'transatlantic' exploits. Again, with a little dash, the company might in time make *Barmouth* as great a source of profit as Scarborough is to the Great Northern. Scarborough is 230 miles from King's Cross; families are taken there in five hours with only *two* stops. Barmouth is only 20 miles farther from Paddington, yet the quickest time is $7\frac{3}{4}$ hours, and there are a dozen stoppages. It is true that when there we have something infinitely lovelier than Scarborough; but what a fraction of the crowds that swamp Scarborough ever visit the panorama of the Mawddach. Some companies are born to a rich seaside traffic, as was the Great Northern; some, like the Great Eastern, achieve it by persistent enterprise; and the Great Western waits dozing till the traffic shall be thrust upon it.

We think it desirable to insert here a few choice instances of English *goods* trains, the Great Northern run being faster than any Paris-Lyons so-called first class express (passenger) along the Riviera, and the Great Western being as fast as the 'Lightning' trains of Italy. The service given for the money here—for our goods rates on the average are very little higher than those given by countries where 10 miles an hour is the rate for a goods train—is probably the best in the world.

It is instructive to note, as an instance of Great Western paradox, that, firstly, the goods trains are given a heavier load beyond Reading, where the gradients become more severe, and secondly, that their best goods train, weighing about 200 tons, does the distance from London to Reading in only two minutes more than their 12 o'clock

'express passenger' to South Wales, this train weighing probably at most 120 tons. The speed of the Great Western goods service is proportionately far better than their passenger speeds.

SPECIMENS OF FAST GOODS TRAINS.

G.W.R.

Broad Gauge.

Miles		Time	Speed
		P.M.	
	Paddington gd.	10 25	} 34
35¼	Reading .	11 27	
		40	} 33
76¾	Swindon .	12 55	
		1 5	} 35·3
118	Bristol . .	2 15	
		25	} 33
	1 stop of 10 mins.		
193½	Exeter .. .	4 52	
	Incl. stops . .		30
	Excl „ . .		33·8

Load to Reading . 23 wagons
From Reading on . 25 „

Narrow Gauge.

Miles		Time	Speed
		P.M.	
	Paddington gd.	9 50	
¾	Portobello .	9 55	
		10 0	} 29 6
35¼	Reading .	11 10	
		22	} 29·7
63	Oxford . .	12 18	
		28	} 28·3
105½	Leamington .	1 58	
		2 3	} 25·3
128¾	Birmingham .	2 58	
		3 5	} 25
141¼	Wolverhampton	3 35	
	Incl. stops .		24·6
	Excl. „ . .		27·7

Load to Reading . 27 wagons
From Reading on . 31 „

L & N.W.R.

Miles		*To Leeds* Time	*To Leeds* Speed	*Conditional Scotch Goods* Time	*Conditional Scotch Goods* Speed
		P.M.		P.M.	
	Camden	10 0	} 20	3 30	} 30·2
4	Willesden	10 12			
		14	} 30·5	5 0	
45¼	Bletchley	11 35			
		45	} 29	8	} 30·2
81½	Rugby	1 0		6 20	
		10	} 28·9	30	} 32
132	Stafford	2 55		8 5	
		3 5	} 28	8 10	} 29·4
156½	Crewe	—		9 0	
181	Stockport (Edgeley Junction) .	4 50			
	Incl. stops		26·5		28·4
	Excl. „		28¾		30·6
	Load		31 wagons		26 wagons

MIDLAND.

To Manchester.

Miles		Time	Speed	Miles		Time	Speed
		P.M.				P.M.	
	St. Pancras .	5 55	28·4		St. Mary's Wf. dep.	11 5	29·6
49¾	Bedford .	7 40					
		47	33	150	Rowsley sdgs.	11 45	
72¼	Kettering .	8 28				12 5	
		31	30		„ station	12 7	
83¼	Mrkt. Harboro'	8 53				12	21
		58	30·4	186¼	Ancoats .	1 55	
104	Syston . .	9 39					
		49	34·2		Incl. stops . .		23·2
128½	Chaddesden .	10 32			Excl. „ . .		27·9
		42					
130¼	St. Mary's Wf.	10 47					

Over a very steep course, with a summit of 1,000 feet between Rowsley and Ancoats.

Load . . . . . 26 wagons

G.N.R.

Liverpool Goods.

Miles		Time	Speed
		P.M.	
	King's Cross (goods) .	8 55	15
2	Clarence Yard	9 3	
		13	34·6
32	Hitchin .	10 5	
		10	33·2
76¼	Peterboro' .	11 30	
		40	30·9
120	Newark .	1 5	
		10	27·7
138½	Retford .	1 50	
	Sheffield .	3 10	
	Liverpool .	7 35	
	Incl. stops . .		28·2
	Excl. „ . .		31·3

Load . . 32 wagons

G.E.R.

Up Yorkshire Goods.

Miles		Time	Speed
		P.M.	
	Doncaster .	10 50	29·4
36¾	Lincoln. .	12 5	
		15	25·5
75	Spalding .	1 45	
		2 0	26·6
95	Whitemoor .	2 45	
	(March)	3 10	
110½	Ely . .	pass	28·7
	Cambridge .	pass	
133¼	Whittlesford	4 30	
		40	33
180	Temple Mills	6 5	
		25	16
184	Spitalfields . (London)	6 40	
	Incl. stops . .		23·5
	Excl. „ . .		28·3

Load . . 30 wagons

LONDON AND SOUTH-WESTERN.

THIS line has four reasons for running fast :

1. The traffic from Plymouth, Exeter, and the south-west generally, in competition with the Great Western. (Once the London and South-Western had ambitious designs on Cornwall, but during hard times they lapsed, and the Great Western meanwhile secured the intermediate links. A last relic of those designs, the isolated Bodmin and Wadebridge Railway, was in 1888 taken over by the Great Western Railway, who united it to their own trunk by making the Boscarne Extension bit from Bodmin Road.) As between Exeter and London, the London and South-Western run nine and the Great Western twelve fast trains (*i. e.* with a journey-speed of 35 miles an hour or over) but four of the Great Western batch are 'first and second class only,' whereas all the London and South-Western are third class, so that the London and South-Western have one more third class 'fast' train than the Great Western. The nine London and South-Western average 4 hours 33 minutes and the eight Great Western 5 hours 10 minutes, but the distances being 171½ and 194 miles respectively, this makes the average journey-speed exactly the same for both companies, 37⅔ miles per hour. With regard to Plymouth, the Great Western have one third class train each way as fast as 6½ hours, while the London and South-Western have two down in 6¼ hours, one up in 6 hours 20 minutes. The distances are 246½ miles by Great Western route, 229½ by the other, but the London and South-Western has the harder route altogether. Neither the South-Western nor Great Western have any third class 'express' between London and Plymouth, though the Great Western has four Plymouth expresses which are first and second class only.

Another active stimulus in summer is the tourist traffic to *Ilfracombe*, Lynton, Westward Ho, &c. Here the South-Western has the advantage, by running on its own line the whole way, while the Great Western carriages are transferred to London and South-Western trains at Barnstaple. The Great Western route is 2 miles shorter than the London and South-Western, which is 225½ miles, but the quickest Great Western journey is 7¼ hours, against 6½ hours by the South-Western. The line from Barnstaple to Ilfracombe is very steep, having several miles of 1 in 40; but the traffic has grown so that the track is now being doubled.

2. *Bournemouth*, with Weymouth, and for tourists the New Forest, Swanage, &c. The Bournemouth traffic has been growing rapidly of late, and is so valuable that the company have recently constructed from Brockenhurst to Christchurch a most expensive short

cut, with a view of saving eight miles in the journey from London. Jointly with the Midland the South-Western own the line from Bath *vid* Evercreech to Bournemouth; on this line too a short cut has been made, and consequent accelerations introduced in the excellent services between Bournemouth and the North of England. It is curious how much more pains have been taken to develop the Bournemouth traffic than that between London and such important towns as Southampton and Portsmouth.

To *Weymouth* the London and South-Western route is 145 miles, as against 168 by the Great Western route; the London and South-Western is twenty minutes quicker than the best Great Western train, and gives a better average service.

3. *Portsmouth, Southampton, Isle of Wight*, with Southsea, &c. Such towns and such a pleasure-garden might have been expected to provoke quick travelling. But until the year 1888 neither Portsmouth nor Southampton had ever had an 'express,' *i.e.* a train running at 40 miles an hour inclusive: and the latter town only gets one now through the kindness of the Bournemouth express, which stops at Southampton West. Portsmouth is still out in the cold, and the Isle of Wight follows.

The South-Western, however, has an enormous *suburban* service, extending to Guildford, Richmond, Windsor, Hampton Court, Leatherhead, Hounslow, Reading, &c., and the swarming nature of this traffic has something to do with the rarity of real express trains on its main lines. The everlasting stir at Clapham Junction is notorious. But a crowded suburban traffic need not, where the executive are energetic, be any obstacle to a first rate express service—as witness the admirable amount of both at Liverpool Street. The style of service provided by a line depends not on its natural opportunities or the size of the population served, so much as on the personality of one or two of its leading officials, and then negatively on the character of the passengers, whether they are prompt to take action as in the North, or apathetic like the South. The South-Western has the advantage of a practically level line as far as Basingstoke, a fact of which they avail themselves to run very long suburban trains.

Though the 'express' service is so small, there is a plentiful supply of good moderate-paced trains, making 33 to 35 miles an hour inclusive, a speed which admits of pretty frequent stoppages.[1]

Every train on the London and South-Western is third class without stipulation.

[1] At the half-yearly meeting, August 9, 1888, a shareholder 'thought people were only frightened away by running these high-speed trains.' No wonder the South-Western trains are so full.

BEST EXPRESSES.

Miles		Time	Speed
		P.M.	
	Waterloo .	12 30	} 48
79	Southampton West .	2 9	
		11	} 47⅔
92⅕	Brockenhurst .	2 28	
107¼	Bournemouth East .	30	} 32¾
		2 57	

Speed incl. stops = 43⅘
„ excl. „ = 45

NOTE.—Between Brockenhurst and Bournemouth the Sway Bank, of very treacherous material, limits speed to 20 miles per hour; when consolidated, the journey will be a quarter of an hour quicker.

Miles			Time	Speed
			A.M.	
	Waterloo .		11 0	} 42
83½	Salisbury .		12 57	
			1 5	} 44
112	Templecombe .		1 44	
			49	} 44⅘
171¼	Exeter	tickets	3 9	
			11	
171½		station	3 12	

Speed incl. stops = 40⅘
„ excl. „ = 43⅖

Another down 2.30 at same speed. In October the afternoon train was quickened to 4 hours; 10 years ago the time was also just over 4 hours.

EXPRESS SERVICE ON SOUTH-WESTERN.

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	Mileage
			H. M.			
171½	Waterloo—Exeter . . .	(2D) 3	4 15	40⅕	43	514½
107¼	Do. —Bournemouth . .	2	2 28¼	43⅕	44⅖	214¼ [1]
83½	Do. —Salisbury . .	(11.5 D) 1	2 3	40¾	42½	83½
	Total . .	6		41⅖	43⅜	812

FAST TRAINS: (*i.e.* over 35 miles an hour).

Miles	Between	No.	Av. time	Speed	
			H. M.		
	Waterloo—Exeter .	6	4 42½	36½	
	Do. —Bournemouth	(3D) 5	2 55	37	
78¾	Do. —Southampton	(D) 1	2 7	37	About 12 others av. 32 to 35 miles per hour
74	Do. —Portsmouth .	4	2 5	35¾	14 others av. barely 30 miles an hour
145¼	Do. —Weymouth .	(2U) 3	4 9	35	
229½	Do. —Plymouth .	(1U) 3	6 22	36	These are the 3 Exeter exp. continued
	Total . .	22			

Picking out from these 'fast' trains any run as long as 40 miles done at 40 miles an hour and upwards, we obtain a secondary ex-

[1] Another (up) added in March, 1889, leaving Bournemouth 8 a.m., arriving Waterloo 10.30

press mileage of 513 miles, averaging 44 miles an hour; thus the total 'express' mileage of the South-Western is:—

Expresses . .	812	miles at	$43\frac{3}{8}$
Runs off 'fast' trains	513	„	44
	1,325	„	$43\frac{7}{8}$ excl. stops.

The whole of this is third class, the one redeeming feature in a result so small compared with the extent of the system.

Note.—The term 'secondary express milage' needs explanation. The great lines north of Thames run either 'express' or 'stopping' trains, which latter of course attain a much lower *inclusive* speed. But the southern lines have several trains which, though not 'express,' are not very far off, trains which run ahead for part of the journey, and then put in stops so as to spoil the average. From such trains we pick out any single run without a stop of 40 miles or over—if it is done at 40 miles an hour—and the scraps of mileage so collected are added in, under the name of 'secondary express mileage,' to the genuine express mileage contributed by *trains which do their entire journey at* 40 *miles an hour including stops.*

There is some justice in adopting this plan with the Southern companies, because the only reason some of their 'fast' trains are not 'express' is that their journeys are in many cases so short, and thus the reduced speed, &c., at each extremity of the run makes a greater proportional reduction in the average speed. When we get north of the Thames we would not insult those spirited lines by searching for such subsidiary mileage: nor would there be a similar excuse for the charitable aid; nor should we find anything to reward our search.

NORTH-EASTERN.

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	Mileage	
			H. M.				
$204\frac{1}{2}$	York—Edinburgh	(7D)13	4 $53\frac{3}{4}$	$41\frac{3}{4}$	$44\frac{1}{2}$	$2,658\frac{1}{2}$	2 others, 12 40 and 7.35 from Edinburgh, average 5.37, not 'exp.' [1]
$80\frac{1}{2}$	Do.—Newcastle	(4D) 7	2 2	$39\frac{1}{2}$	43	$563\frac{1}{2}$	
$42\frac{3}{4}$	Do.—Scarboro'	(7D)13	1 6	39	$40\frac{2}{5}$	556	9 others average $1\frac{1}{4}$ hr.
$47\frac{3}{4}$	Do.—Stockton	(D) 1	1 12	$39\frac{4}{5}$	$42\frac{3}{4}$	48	
$51\frac{1}{2}$	Leeds—Hull	(3 to Leeds)5	1 $17\frac{1}{2}$	40	$4\frac{5}{8}$	257	
	Total	39	averag.	40	$43\frac{5}{8}$	4,083	

Between Leeds and York (24 miles) there are 11 trains taking 40 minutes (no stop), a running speed of 38 miles per hour.

[1] These two, however, do run at 'exp.' speed overthe section between Berwick and Edinburgh, and their mileage to that extent is therefore credited to the N. British Co. See p. 61.

The North-Eastern engines work the East Coast expresses right through to and from Edinburgh, so that we credit the company with the mileage, though the route is North British west of Berwick.

The North-Eastern metals traverse a district ever memorable in railway history, and its main track is comparatively level; but neither easy gradients nor proud memories can prevail against an unexcitable executive and the consciousness of a safe monopoly. The company know that they can always rely on that willing horse, the Great Northern, to do wonders south of York, so they have for years shirked their share of speed in the Scotch traffic, and the public accordingly speak of the East Coast route as 'the Great Northern route,' oblivious of the fact that the longer half of the journey is run by North-Eastern engines. Last summer, of course, the company were forced to wake up and show what they could do in the 'race,' but even then they held back till the eleventh hour, and it was chiefly owing to this spectacle, in striking contrast with the dash of the rival Caledonian, that the North-Western was emboldened to forget its extra eight miles of route (over much harder ground) and succeeded in subduing the Great Northern to 'tie' with it in duration of journey. Perhaps when the Forth Bridge is open the North-Eastern will rise to the occasion, and deal blows worthy of its ancestry in the inevitable fight which will then ensue.

No company has more powerful engines or better drivers; all that is wanting is stimulus. The Scotch trains are very heavy, but the comfortable gradients atone for that. Much admiration is sometimes expressed for the run of the down 'Tourist' from Newcastle to Edinburgh, 124 miles without a stop in 2 h. 53 m., or 43 miles an hour; yet the 10.40 Edinburgh train of the Midland runs

BEST EXPRESSES.

Miles		Time	Speed
		P.M.	
	York . .	1 50	
80½	Newcastle . .	3 23	52
		28	
201½	Edinburgh .	5 45	54⅓

Inclusive speed = 52⅕
Running average = 53⅓

This was the Edinburgh express as run from August 13 to 31, 1888. It generally arrived before time; on the 31st it reached Edinburgh 5.27.

Here, again, probably to make light of the whole affair, the speed was higher on the steeper portion of the route.

		Time	Speed
		A.M.	
	York . . .	12 5	
	Newcastle . .	1 47	47⅓
		52	
	Edinburgh . .	4 45	43

Incl. speed = 43⅘. Running av. = 44⅔
'Tourist,' 8 P.M. King's Cross.

Miles		Time	Speed
		P.M.	
	Leeds . .	1 15	
67½	Scarboro' .	3 0	38½

There must be some mistake here, for this is advertised as 'Through Express.'

also without a stop the 124 miles to Nottingham, with a lighter load but a much heavier route, in 2 h. 25 m.—that is, at the rate of 51⅓ miles per hour. The North-country line glories more in its good dividends than in its high speed.

The most creditable North-Eastern trains are those which climb up and down the various steep branches worked by the company. Relying on the Westinghouse brake they are able to drop down steep grades at a speed otherwise unadvisable, and, as for climbing, they soar up successive miles of 1 in 40 (e.g. Whitby to Scarborough) or 1 in 60 with a light-heartedness that would scandalise the decorous companies south of Thames. The ascent from Kirkby Stephen to the summit of Stainmoor, 1,369 feet above the sea, is a good example of these brisk cross-country performances.

MANCHESTER SHEFFIELD AND LINCOLNSHIRE.

THIS line runs east and west across the busiest part of England—from Hull to Manchester and Liverpool. It is therefore sandwiched between the three arterial trunk lines to the north, mere contact with which should be a powerful stimulus. It has also a hard task to perform, in alliance with the Great Northern, to reach Manchester from King's Cross (203 miles) in the same time as from Euston (189), with the Pennine to surmount. The main line from Manchester to Retford is the hardest piece of similar length in England (except the Great Western Railway in Cornwall). Only 7 miles out of the 64 are easier than 1 in 200; the remaining 56 average about 1 in 140. From Sheffield to the *Woodhead* tunnel (1,010 feet above sea, 3 miles

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	Mileage	
			H. M.				
97¼	Manchester—Grantham	2	2 12	44⅕	45⅔	195	2 P.M. up and down, to and from King's Cross
64⅓	Do. —Retford	12	1 43	37⅜	41½	774	the other G.N. expresses
43¼	Liverpool—Godley	10	1 11½	36½	41	432	heavy grades and many stops, &c.
20	Godley—Penistone	4	0 31	38¾	38¾	80	admirable up-hill speed
13	Sheffield—Penistone (to and from *Huddersfield*)	2	0 20	39	39	26	admirable up-hill speed
	Total	30	averaging	38	41⅔	1,507	
To this must be added one-third of the 'Cheshire Lines' express mileage				44⅔	47	599	
Giving total of				42	43¼	2,106	

long) are 18½ miles of unbroken ascent averaging 1 in 125, or coming from Manchester 22½ miles averaging 1 in 145. On such a track anything over 35 miles an hour inclusive is a fine 'express,' and that *average* means a speed on the descending slope of the roof so high that it is difficult to feel comfortable unless we know the best brake power is retained. During the last four years the Manchester Sheffield and Lincolnshire have had the two worst accidents of the period, and in each case the train was equipped with the 'simple vacuum' brake, one of the mildest varieties in vogue. Those who climb mountains cannot afford any but the best, and the company has lately made a change in the right direction.

Intimately connected with the Manchester Sheffield and Lincolnshire is the

CHESHIRE LINES COMMITTEE.

THIS is an executive formed by the Manchester Sheffield and Lincolnshire, the Great Northern, and the Midland. In 1875 they opened the first-rate line from Manchester to Liverpool, *viâ* Glazebrook, Warrington, Garston, chiefly at the instigation of the Midland, who thenceforth had a clear way into Liverpool for their London expresses. The Great Northern Liverpool carriages also run over this line between Glazebrook and Liverpool. In 1887 they opened the new branch from this line to *Southport*. Since 1875 the whole service between Lancashire and London, and between Liverpool and Manchester, has in consequence been revolutionised by the insinuating power of this competitive wedge. An hourly service was at once started between the two great towns, doing the 34 miles in 45 minutes, with a stop at Warrington ; the North-Western had to follow suit (theirs is the original line made by George Stephenson, 31½ miles long), and now this bit of Lancashire ground, which first saw the wonder of high speed, is the focus of the smartest running in the world. At each even hour the North-Western express starts from either end, and the 'Cheshire Lines' at each half-past, besides which 10 other trains are thrown in that do the trip in 40 minutes without a stop. There are *sixty* (28 London and North-Western, 32 Cheshire Lines Committee) of these express journeys every day, the average time being slightly over 44½ minutes. But between *Warrington* and Liverpool the London trains of the Midland and Great Northern come upon the scene, adding *twenty* more to the number ; nearly all these stop (if required) at Warrington, so that between this town and Liverpool there are *fifty* 'express' runs daily, not counting plenty more which take a little longer because they stop more. Besides these two express routes there is

that of the Lancashire and Yorkshire (39½ miles) *viâ* Wigan,[1] bristling with speed which is only not 'express' because of stoppages; while a fourth route, the North-Western *viâ* Warrington, distance 37¾ miles, contributes a few smart instances. This swarm of rapid trains have to cut their way through a maze of murky junctions, but they are as punctual as chronometers. The cultured Londoner must drop many a tear when he sees such a high standard of performance daily maintained in the rude provincial air.

The expresses of the 'Cheshire Lines' are worked by Manchester Sheffield and Lincolnshire engines, and this line deserves great credit for the remarkable speed accomplished; but since the train service is organised by the Joint Committee, which includes as well the Midland and Great Northern, we have allotted one-third of the total 'Cheshire Lines' mileage to each of those three companies.

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed		Mileage	
				incl.	excl.		
			H. M.				
34	Manchester—Liverpool	4	0 40	51	51	136	
34¼	Do. Do.	28	0 45	45⅔	47¾	959	
49¾	Manchester—Southport	8	1 9	43¼	46⅔	398	
34	Warrington— do.	8	0 51½	40	44	272	
31¼	Liverpool— do.	1	0 48	39	43⅗	31	5.12 P.M.
	Total . .	49	averag.	44⅔	47	1,796	

Giving 599 miles at an inclusive speed of 47 to be added to the express mileage of the Great Northern, Midland, and Manchester Sheffield and Lincolnshire companies.

BEST EXPRESSES.

Miles		Time	Speed
		P.M.	
	Grantham .	4 4	} 50
56⅝	Sheffield .	5 12	
		16	} 41⅔
97⅝	Manchester .	6 15	

Incl. speed = 44·7 } Over a summit
Excl. „ = 46 } of 1,010 ft.

Worked by engines with a 7-ft. 6 single driver.

Miles		Time	Speed
		A.M.	
	Manchester .	10 0	} 51
34	Liverpool .	10 40	
		P.M	
	Manchester .	5 10	} 53
48½	Birkdale .	6 5	
		7	
49½	Southport .	6 10	

These services are remarkable for the very high average speed attained over a route thick with stations and junctions, and teeming with traffic.

[1] Now reduced to 35 miles by the Hindley cut.

HULL AND BARNSLEY.

THIS newly-born line, hitherto as unfortunate as it is young, can scarcely be said to stand upon its legs as yet. It should, in concert with the Manchester Sheffield and Lincolnshire, provide the most direct route between Hull and Manchester and Liverpool. So far it has done some good by reducing monopoly rates, but it can never itself flourish until the great companies by which it is surrounded adopt another attitude than their present one of waiting to pick its bones.

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed		Mileage
				incl.	excl.	
			H. M.			
52¾	Hull (Cann.St.)—Cudworth	2	1 20	39½	43⅓	105½

CHATHAM AND DOVER.

THIS little line is a great thorn in the flesh to Sir E. Watkin. Not only has it splendid boats which cross to Calais in the hour, but it wickedly devised for itself the popular service between Flushing and Queenborough. The line to Dover is very steep (1 in 100) throughout, but the Continental and two fast Ramsgate trains are run in dashing style. (These two 'Granville' are the only L.C. & D. expresses that carry *third-class* passengers.) All trains except the 'express' have hitherto been worked by hand-brake; now the company are fitting the Westinghouse on all. The *Empress* and *Victoria* have nearly doubled the Dover-Calais traffic. The Chatham and Dover is our youngest, poorest, and pluckiest line.

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed		Mileage	
				incl.	excl.		
			H. M.				
78	London—Dover .	(4U) 7	1 51	42	43¾	546	'1st and 2nd' at exp. fares
80	Do. —Ramsgate	2	2 0	40	42	160	'Granville' expresses
	Total .	9		41½	43	706	

'FAST' SERVICE.

Miles	Between	No.	Av. time	Speed	
			H. M.		
50	London—Queenboro' .	4	1 25	35⅓	2 of these take 1.20, = 37½ miles an hour
74	Do. —Margate, &c.	12	2 17½	32⅓	Would all be 'exp.' on the Continent
		16		33	

BEST EXPRESS.

Miles		Time	Speed
		A.M.	
	Victoria . . .	8 20	
4	Herne Hill . .	8 27	
		29	} 46¼
78	Dover . . .	10 5	

Inclusive speed = $44\frac{3}{5}$ Exclusive speed = $45\frac{2}{5}$

TILBURY AND SOUTHEND.

THIS suburban line runs from Fenchurch Street to Shoeburyness, 40 miles. The only 'express' trains are one each way between Southend and the City. But the whole service of short journeys through a very poor and crowded area is most briskly carried out, partly because, as in the analogous case of the Great Eastern, the Westinghouse brake is employed to save every second. All trains are third class except the two expresses, but the fares are so low that they too are really 'third,' for the second class fare is less than a penny a mile.

EXPRESS SERVICE.

Miles	Between	No.	Time	Speed		Mileage
				incl.	excl.	
$35\frac{3}{4}$	Fenchurch St.—Southend	2	H. M. 0 50	43	43	$71\frac{1}{2}$

GREAT EASTERN.

No one can help admiring the Great Eastern. For twenty years, during which it has been bravely recovering from an unparalleled history of robbery and general misfortune, with dividends none or next to none, it has nevertheless treated passengers—especially third class—in a style less petty and more intelligent than its wealthier neighbours. Above all, as regards tourist and seaside traffic it has set an example of sensible liberal behaviour; unlike the Southern companies, it does not restrict the holders of its 'cheap tickets' to some one peculiar train (with old rolling-stock, crammed), but allows them free choice of the best expresses, just as if ordinary fare had been paid. And these very cheap seaside fares are maintained

right through the winter. The Great Eastern staff, too, are in the best sense no respecters of persons; third class and first they treat with equal civility, or, at least, as nearly so as is compatible with a sense of humour. Perhaps some of the daily suburban travellers on the line may dissent from this praise, for they have a great deal to endure at times; but this is owing to the enormous increase of traffic that followed the entry into Liverpool Street, a stream now swollen to such a flood that to carry it in and out the company finds itself compelled to double at a huge expense the costly approaches to that admirable terminus. Concurrently with this outlay the Great Eastern had prepared a Herculean scheme for the complete transfiguration of its station and network at Cambridge, where four rival

EXPRESS SERVICE.

Miles	Between	No.		Av. time	Speed incl.	Speed excl.	Mileage	
				H. M.				
182½	Liverpool St.—Doncaster	(2U)	5	4 23½	41⅛	45	912	
70½	Ely—Liverpool St.	(U)	1	1 47	39½	42	71	arr. 9.10 P.M.
180	Doncaster—Parkeston Quay		2	4 42	38⅓[1]	42	360	4.48 Donc., and 7.43 Park Quay
14¾	Cambridge—Ely		1	0 21	42	42	15	9.23 A.M. from Camb.
183	Doncaster—Yarmouth	(U)	1	4 40	39	44⅘	183	10.55 A.M. from Doncaster
125¼	St. Pancras—Norwich	(D)	1	3 5	40⅔	43⅔	125	12.5 from St. Pancras
53¾	Ely—Norwich	(D)	1	1 23	39	42⅔	54	off 8.45 A.M. from Liv. St.
55¾	Liverpool St.—Cambridge	(3D)	8	1 22¾	40⅔	42	446	11.55, 2.32, 5.15 down; 8.51 9.43, 1.30, 7.3, 9 up[2]
56¾	St. Pancras—Cambridge	(1U)	4	1 22¾	41⅜	43½	227	9.15, 2.35, 5.5 down; 1.23 up
26½	Lynn—Ely		4	0 38	41⅘	41⅘	106	
	Total on Cambridge Line		28	averag.	40¾	43⅗	2,499	
138¾	Cromer—Liverpool St.		2	3 30	39⅔	42[1]	277	
115	Norwich—Do.	(U)	1	2 48	41	44¼	115	8.50 A.M. up
121¾	Yarmouth—Do.	(U)	1	3 5	39½	41	122	2.0 up
68¾	Parkeston Quay—Do.		2	1 45	39⅓	39½	137	Boat Trains
68¾	Ipswich—Do.	(4U)	10	1 41¾	40½	42	688	
51¾	Colchester—Do.	(1U)	3	1 15	41⅖	42½	155	5.10, 5.30 down 2.2 up
40½	Beccles—Ipswich		4	1 0	40½	40½	162	
17	Colchester—Do.	(D)	1	0 25	40⅘	40⅘	17	off 8 P.M. Boat Train
	Total on Colchester Line		24	averag.	40½	41⅗	1,673	
	Do. Cambridge do.		28	,,	40¾	43⅗	2,499	
	Total		52	averag.	40⅗	42⅚	4,172	

[1] These trains run part of their journey over single line where the stops to exchange staff lower the average.

[2] Yet these are timed to average 47½ miles an hour between Tottenham and Cambridge.

companies embrace in a tangle of mutual inconvenience; but this godsend was stupidly declined, chiefly owing to opposition fabricated by members of the University, who by tradition take the blind side in railway matters.

The actual running on the Great Eastern is very much faster than would appear from the 'average' speeds given in the table, because the average is spoilt by an exceptionally large number of sharp curves, junctions, swing-bridges, &c., which require reduced speed; and the first six miles out of London are a great stumbling block. On the other hand, the Great Eastern is almost Continental in its punctuality; every day expresses arrive at Cambridge or Liverpool Street a minute or two before their time, and, with the exception of the Doncaster expresses, these are very heavy trains. Though the Company is poor, the carriages are well lighted, the permanent way is first rate, and the Westinghouse automatic brake is on every carriage.

Now that we are north of the Thames we have no occasion to try and apologise for a poor batch of expresses by offering a list of 'fast' trains; the great companies run either 'express' or 'stopping' trains, with very few mongrel instances. But the stopping trains run by the Great Eastern are very smart indeed; as with the Great Northern, the best engines are used in this sort of service, and the performance is at least as meritorious as that of the expresses. Its suburban trains—long and choked with passengers—are also admirably worked, by powerful tank engines which attain higher intermediate speeds than are found on any other line with such short distances.

BEST EXPRESSES.

Miles		Time	Speed
		P.M.	
	Liverpool St. .	4 32	
55¾	Cambridge .	5 47	44⅔
		50	
70¼	Ely. . .	6 10	44¼
	(slow over Bedford Cut)	12	44⅓
85¾	March . .	6 33	
		37	
105¼	Spalding. .	7 2	46⅘
		4	
123¾	Sleaford . .	7 28	46¼
	(tickets)	30	
145¼	Lincoln . .	8 0	46

Miles		Time	Speed
		P.M.	
	Lincoln . .	8 2	
160¾	Gainsborough .	8 22	46½
		23	
182	Doncaster .		51
	tickets	8 48	
	station	8 50	

Inclusive speed = 42½
Running average = 45⅔

An unusual number of very sharp curves in this journey.

This is a very fine express, as the stops (after Cambridge) are so frequent that there is little chance of attaining very high speeds.

SEASIDE EXPRESS FROM YORKSHIRE.

Miles		Time	Speed	Miles		Time
		A.M.				
	Leeds and York .	10 0				
0	Doncaster . .	10 55	47			
21¼	Gainsborough .	11 22				
		23	48			
36¾	Lincoln (tickets) .	11 44				
		47	49			
75	Spalding . .	12 34				
		36	46⅘			P.M.
94½	March . . .	1 1			Peterborough, G.N.	12 40
	(slow over Cut)	4	44⅓		do. G.E.	12 50
110	Ely	1 25		14¼	March . . .	1 12
	back to	32				15
111¼	Ely Junction .	1 35		28½	Ely Junction arr.	1 35
	dep.	41	46		(attached to Doncaster train)	
162¾	Trowse . . .	2 48			Trowse . dep.	2 53
		50				
174¾	Reedham . .	3 11		163¾	Norwich . arr.	2 58
		18				
181¾	Breydon . .	3 32			Reedham . dep.	3 22
183	Yarmouth . .	3 35		186	Lowestoft . .arr.	3 48

Inclusive speed = 39 Running average = 44⅘

This train is given as a sample of many Great Eastern expresses, whose journey is so spoilt by frequent stops (*e.g.* every 18 miles in the above case), as well as by delays for attaching and detaching tributary portions, that the 'inclusive speed' of the main portion ultimately comes out barely 'express,' although during the journey the intermediate average speeds have been very high.

SOUTH-EASTERN.

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	Mileage	
			H. M.				
75½	London—Dover . .	8	1 43	44	44	604	'1st and 2nd class' at express fares.
69¾	Do. —Folkestone .	2	1 35	44	44	139½	Do.
60	Do. —Hastings .	2	1 31	40	40	120	
84¼	Do. —Ramsgate .	2	2 8½	39⅓	40½	168½	'Granville' trains.
	Total . .	14		42⅔	43	1,032	

The trains are taken as between Cannon Street (or London Bridge) and their destination, on account of the delays arising in the short stage between Cannon Street and Charing Cross. Similarly 'Folkestone' means Folkestone Junction, and 'Hastings' St. Leonards.

'FAST' SERVICE.

Between	No.	Av. time	Speed incl.	Speed excl.	
		H. M.			
London—Dover . .	(U) 1	1 55	38⅔	40⅓	'1st and 2nd cl.' — 10.27 A.M. (from Ostend)
Do. —St. Leonards .	(2 D) 5	1 43	35	—	10 others average about 2¼ hours
Do. —Ramsgate .	6	2 29	34	—	
	12				

These 'fast' contribute 148 express miles run at 40⅓ miles per hour, so that the total South-Eastern express mileage is :—

Expresses . .	1,032	miles at	43
Runs off 'fast' . .	148	„	40⅓
	1,180	„	42⅔ excl. stops.

BEST EXPRESS.

'1st & 2nd class.'

Miles		Time	Speed
		A.M.	
	Cannon Street . .	11 7	47
75½	Dover (Town) . .	12 43	

The 'Continental' trains run by the South-Eastern show a very fine performance as regards *speed*, for the gradients between London and Tonbridge Junction are very severe (a long pull of 1 in 120). The same remark applies to the Hastings expresses, whose route is much harder again. And all these are heavy trains. The third class carriages on the Ramsgate and Hastings trains are more roomy than the average in England. The passenger communication with the guard is far superior to that mockery provided on our great lines to the North. The termini at Charing Cross and Cannon Street could not possibly be better situated—when once you arrive.[1]

But the South-Eastern manages to secure more ill-will from the public than perhaps any other line. It is audaciously unpunctual, but so are all its three Southern neighbours. Its express trains (with one or two exceptions due to competition) will not look at third class passengers—nor (with the same exceptions) will those of the Brighton or Chatham lines. Its fares are enormous for first and second class. Perhaps its eminent ill-repute arises partly from the

[1] See Note next page.

supposed despotic tone of its management, from their apparent eagerness to be always engaged in civil war, and lastly, from their ruthless sacrifice of local convenience whenever 'Continental' trains are in question. Much of the public odium which attaches to the South-Eastern is equally due elsewhere, but also most of it is founded on concrete fact. For our present purpose, however, the consideration of express speed, this line is a subject for praise; its expresses, few in number as they are, and mostly limited to first and second class, are distinctly brilliant examples, and those to Hastings, which are third class, and travel over one of the hardest routes in England, are as much to be praised as any anywhere.

It is impossible, too, to avoid noticing the magnificence of the engineering which marks the course of the South-Eastern (we are not concerned with its failure to produce architectural elegance), not only along the strip of chalk cliff between Folkestone and Dover, but in the direct flight which it pursues—at the cost of huge embankments and tunnels—from London Bridge to Tonbridge Junction. Only at immense outlay was it able thus to secure a route to Dover capable of competing effectively with that of its young rival, the Chatham line.

Note.

'The South-Eastern Railway Company, although most favourably placed with respect to the number and situation of its London termini, is at the other end of the scale in regard to its accesses to the same. Railway experts from the Continent or America marvel that the delays are not enormously greater. Sir Myles Fenton, the general manager of the company, has had a great deal of experience in working crowded lines in London and Lancashire. He organised the opening of the Metropolitan Railway, and was associated with that company for seventeen years. For some years he also worked the Metropolitan, and altogether he has had a railway record of forty-three years. There is no piece of traffic which requires so much care, and is attended with so many difficulties, as the working of that part of the South-Eastern's system which lies between London Bridge and Cannon Street and Charing Cross. A plan of the line at once shows the natural obstacles in the way of expeditious working. Trains from London Bridge to Charing Cross cannot get in without crossing the path of outgoing trains from Cannon Street, so that there is a constant crossing and recrossing, which all means delay. Every down train from Charing Cross crosses two up lines to get on to the down line. The space in the stations is so limited that empty as well as loaded trains must be

immediately despatched, and in consequence of the shortness of the line at the south side of Cannon Street bridge, an empty from Charing Cross which is being sent down to Rotherhithe Road, where they are stacked, may completely block Cannon Street station. It often happens that there are trains standing at every signal for some distance down the road, a delay with one necessarily affecting all the others, both up and down.

'Under these difficult conditions no fewer than 850 loaded trains are daily taken into and sent out of Cannon Street and Charing Cross stations. Continental expresses, seaside trains, the locals, and the others which make up this total, have all to pass through the narrow neck outside Cannon Street. Other companies can shunt their local traffic—as the northern and other lines do—and the Brighton has completed its duties when London Bridge is reached, but the South-Eastern must get over the river at two points with the bulk of its traffic. The distance is so small that the delays, which are inevitable under existing conditions, irritate the public, and the company gets a reputation for unpunctuality. "None the less," the general manager remarks, "up to London Bridge we can compare with any other company in the matter of punctuality." The services are also affected by delays on the lines between Redhill and London, which are crowded with trains of the Brighton Company, frequently causing a dislocation of the South-Eastern trains, especially during the most important hours of the day. Difficult, however, as it is under normal conditions, the working of the traffic becomes appalling when fog comes down. On the most favoured roads trains are impeded under such circumstances, but here, when the signals and trains are hid from view, there is an inevitable collapse of the ordinary services. The trains have to be hand-signalled in and out without any regard to the time-table.

'The remedy for the evil is not hid from the directors and their staff, but it means money, and that to a very large amount—how much it would be rash to say. What they are doing is to proceed by degrees, and as a first step they have widened Charing Cross bridge, and have nearly completed the same operation at Cannon Street. They have, further, acquired the land for the purpose of broadening the viaduct between London Bridge and Charing Cross, which carries at present three lines; they have obtained land in order to extend London Bridge station, and have begun the work; they have also purchased some of the land for widening Charing Cross station. When the extensions are made at London Bridge, instead of one down road for the main line traffic there will be two, which is the minimum of other companies. The doubling of the bridge at Cannon Street will give ten instead of five lines into that station; and the Charing Cross bridge now furnishes six instead of three.

This addition has been in practical use for some months, and already the extra facilities have proved advantageous, although its full value will not be realised until the whole scheme of extension has been completed.'—*Pall Mall Gazette*, November 1888.

The delays will never cease until trains are worked *separately* for Charing Cross and Cannon Street, so that this crossing on the level may be put an end to. This was the original intention of the engineers of the line, and the inside metals between Charing Cross and Cannon Street were meant for a single line 'shuttle service' to be working constantly and punctually between those two points.

BRIGHTON AND SOUTH COAST.

This line has always been smart, though scarcely great, in the matter of speed; and it has improved the last year. Many of its 'fast' trains would be expresses but for two reasons: (1) the distances are so short that after deducting stops and suburbs there is not a long enough break of open road in which to make up the required average speed; and (2) the road between Redhill and London Bridge is used by the South-Eastern as well—source of unnumbered woes to passengers by either line. (See p. 47.)

Still the average speed of the 17 'expresses,' 42 miles per hour, is hardly satisfactory, for the distance between Liverpool and Manchester is only 34 miles, yet over 60 trains in that case manage to attain an average speed of nearly 47 miles an hour; all these 60 are third class, but of the 17 express on the Brighton line only 9 carry third class passengers. Brighton itself has not a single 'express' third class, while even out of its 11 'fast' trains to and from London 7 decline that sort of traveller.[1]

BEST EXPRESSES.

Miles		Time	Speed
		P.M.	
	London Bridge	4 55	
86	Portsmouth .	6 55	43

2 stops since put in; arrives same time.

Miles		Time	Speed
		P.M.	
	London Bridge	5 0	
50½	Brighton .	6 5	46½

[1] The L.B. & S.C. will not carry a third class passenger to Brighton in their *ordinary* fast trains, but at special Cheap fares they take him to and from London with only two or three stops, a journey much superior to the ordinary third class ones. These special trains run on Saturday, Sunday and Monday.

On March 1, 1889, the L.B. & S.C. began a new express, 9.25 a.m. from Brighton, reaching London Bridge (without a stop) at 10.38. This is a speed of 41½ miles an hour, yet the Company consider it so good that the train is '1st class only.'

Miles		Time	Speed
		A.M.	
	Eastbourne . .	9 55	45
55	Croydon . . .	11 8	
		11 10	
65	London Bridge .	11 27	

The Brighton train is 'first only,' the others third class, but the Brighton is much the heaviest of the three, varying from 12 to over 20 carriages, and keeping excellent time. Perhaps however the Portsmouth express is the most praiseworthy, because of the severe gradients (1 in 80) it has to encounter. The Eastbourne train is comparatively light.

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed. incl.	Speed. excl.	Mileage	
			H. M.				
86	London—Portsmouth.	2	2 0	43	43	172	
74½	Do. —St. Leonards	(1U) 3	1 50	40⅔	41⅖	223	
65	Do. —Eastbourne .	(2U) 5	1 36½	40½	41⅓	325	
50½	Do. —Brighton .	(3U) 7	1 12½	41¾	42	352	4 of these are '1st only' — 3 are '1st and 2nd cl.'
	Total .	17		41⅓	42	1,072	

FAST TRAINS.

Miles	Between	No.	Av. time	Speed	
			H. M.		
	London—Portsmouth.	12	2 33	34	the 'Up' are the quickest.
	Do. —St. Leonards	(3D) 7	2 8	35	St. Leonards is served better than Eastbourne, owing to S.E. competition there.
	Do. —Eastbourne .	—	—	—	has several trains averaging about 30 miles per hour inclusive.
60	Do. —Worthing .	(D) 1	1 35	38	
	Do. —Brighton .	(5U) 11	1 23½	36⅓	2 of these are '1st only'; 5 are '1st and 2nd class.'
56¾	Do. —Newhaven .	4	1 37½	35	2 of these take 1½ h. = 38 miles per hour; but they are '1st and 2nd class.'
		35		35	

These 'fast' trains contribute 12 express runs, averaging 42 m. per hour, making the total express mileage of the London Brighton and South Coast:—

Expresses	1,072	miles at	42 miles per hour.
Runs off 'fast' trains . .	490	„	42 „
	1,562	„	42 excl. stops.

Taking the express and fast trains together this is certainly a very brisk service, all things considered. But the effect is marred by the exclusion of third class passengers to such a wholesale extent; whenever a Brighton train prepares to run as much as 40 miles (or less) without a stop, and at such a speed as 38 miles an hour, it exhibits a virgin horror of third class passengers which must keenly touch the humour of North-country people. No doubt the morning and evening 'business trains' conveying season ticket residents at Brighton must remain 'first only,' their length being already so great (and their tickets are very cheap); but most of the others could stand the addition of third class carriages without overcoming the engine-power. Of course if third class were added it would have to be added to *all* the fast trains [with the above exceptions], otherwise there would be a rush on the particular trains so favoured. Perhaps the Brighton Company, looking at the present crowded state of the joint line North of Redhill, are unwilling to have to arrange for the extra traffic which would confront them if their trains were all third class, or perhaps they believe the change would not pay them. In either case their attitude is peculiar. Much as they dislike the South-Eastern, they pay it the compliment of imitation in regard to this antiquated policy towards third class passengers, *i.e.* towards 90 per cent. of the nation. Besides, considering the special circumstances and avocations of the people who now fill their 'first and second class' trains, there is less reason than on most lines to fear that there would occur to any great extent that 'degradation' of passengers' which has so stirred the soul of some railway chairmen. It is nearly certain that universal third class on the Brighton trains would evoke a large amount of new traffic, without much backsliding from the higher classes. If not, then the company must at present be earning good dividends at the cost of unpopularity, not to say ill-will.

It is worth dilating on this point, because in so many respects the London Brighton and South Coast deserve special praise. Their accommodation is very good, their men are very smart and at the same time very attentive to passengers, while in efforts to provide better lighting and efficient brakes they put to shame their wealthier rivals North of Thames. The electric light is spreading on their suburban trains, and the Westinghouse brake, which they were the first to recognise in England, has long been universal over their system.

In another matter, that of punctuality, the Brighton Company

can hardly be congratulated. This is the chief vice of all our Southern companies, and amounts to a serious fraud on the public. There are Suburban trains running 9 or 10 miles by which one may travel daily for a year and not arrive within 5 minutes of the proper time in 95 per cent. of the journeys. Such habitual sloppiness must demoralise the entire staff. Many of the main line trains are proportionately late. Yet the gradients are very favourable, 1 in 264 being the usual one, except on the Portsmouth and Tunbridge Wells lines.

REMARKS ON THE SOUTHERN LINES.

THE naturalist is still compelled to maintain that our railways south of Thames are, from the public point of view, quite another species from those to the north of that narrow stream. The traveller who cabs across from Waterloo to Euston, from Victoria to St. Pancras, or from London Bridge to King's Cross, is in each case moving to a higher railway atmosphere, where the time-bills are meant to be taken in good faith, where the quality of the service is superb, and where we can rely on its being the rule, not the exception, to carry out what has been contracted for.[1] We say adieu (or *au diable*) to the 'cheery stoicism' of that South-Western terminus, where in-coming trains arrive at their own sweet time and place, to the subtle irony of the Brighton with its 'fast' and very 'limited' style, to the South-Eastern with its fore-ordained chronic block in sight of port, to the Chatham with its hand-brakes; and we alight upon platforms of common sense, where efficiency is high, where only fares are low. Good-bye to the sportive tricks of Southern complexity; now we come to stern simplicity, which merely says and does. Only the deeds are first class, though most of the passengers are third.

The Southern lines form a group which must be called a different species if only because they are wanting in that essential characteristic *punctuality*. Of course there are good reasons—though bad excuses—for the fact, but the unpunctuality is none the less a monstrosity. Trains which never (well, hardly ever) throughout the year arrive decently near their time are maddening to everyone except the officials; there is no point in them, they have lost their savour, and are as different from the real article as a stale egg from a fresh one. Besides this lapse in regard to the crowning virtue, there are other reasons why the Southern companies are justly unpopular. They pay very good dividends, yet charge exorbitant fares

[1] From this praise we must exclude the Midland and the Great Western during *summer*. See p. 8.

—what a contrast to the Great Eastern! But the *South-Western* must be exempted from this particular reproach; it deserves peculiar respect for upholding universal and unconditional third class amid such demoralising companionship, though its first and second class fares are high. On the South-Eastern we seem to hear the old greeting of the highwayman, 'Your money or your life;' for unless the victim be prepared to empty his purse he must adjourn to the slow trains of that corporation, and life is not worth living there. Then there is a feeling that in this part of England the companies are leagued against the public, because here flourishes the un-English system of 'pooling' the receipts from traffic to competitive places. Compare the number of express trains run between *e.g. Cambridge* and London by Great Eastern and Great Northern with those enjoyed by Portsmouth or Dover; in the latter case each company takes from its rival part of its motive to exert itself, while the two northern companies, adopting the grosser form of competition pure and simple, do the very best they can. The result is that Cambridge has fifteen times as many third class 'express' journeys as either of the southern instances.

But we must not paint things blacker than they are. There is something to be set off against all this abuse. In some respects the southern companies put the northern ones to shame. Though their trains run shorter distances than any, they are provided with the best communication between passenger and guard—not with that satirical 'cord' which undulates so gracefully beneath the eaves of the carriages on our leading lines. Again, it is on a southern line—the Brighton—that we find the greatest advance in the lighting of carriages. Not only on the Pullman cars, but in the third class of its commonest suburban trains, the electric light is gradually spreading, so that the smallest print may be read with ease.

Where the southern lines however most excel the northern ones is in the matter of *Sunday* arrangements. They make the best of this terrible day, not the worst, and deal with conflicting interests in a sensible way. To a layman fond of fresh air there is great satisfaction in watching the volley of 'cheap seaside' trains fired off by the Brighton Company every Sunday morning (in summer), carrying thousands of the 'masses' out of London and alcohol to the healthier air of Littlehampton, Bognor, Worthing, Brighton, Eastbourne, or Hastings.[1] These trains are practically express, and charge one-third the ordinary third class fare. The Brighton is the largest benefactor in this respect, but similar praise is due to the South-Eastern and Chatham for their corresponding facilities to

[1] These Sunday 'cheap' trains afford a quicker journey than can be had any week-day for ordinary third class fare.

Ramsgate, Margate, and the Kentish coast in general.[1] The South-Western is very genial, for it starts a 'cheap' train at the pleasant hour of half-past nine, and, running at 35 miles an hour inclusive, gives seven hours at Bournemouth before the equally quick return home. On Sunday these four southern companies show in their best colours, and offer a happy contrast to that gloomy dog-in-the-manger policy with which the northern lines disfigure the day.

No doubt these distinguishing traits, both good and bad, owe their existence in some measure to the intimate relation in which our southern companies stand to the Continental lines; in daily working partnership with them they cannot help adopting some of their ways and points of view. Unfortunately our southerners have failed to imitate their Continental brethren in that one point where they are most admirable, punctuality. From Mentone to Calais is 875 miles, but the through carriage will almost invariably arrive at Calais at its schedule time, and then on the remaining section of 100 miles to London the passengers will lose a quarter of an hour or more. We prefer 'this direct simplicity of the French mind' to the pretentious promise which cannot be fulfilled. There are, of course, sufficient reasons why it is much harder for an ordinary English express to be punctual than for one on the Continent (*e.g.* third-class passengers, heaps of luggage, booking allowed at the last moment, the barbarity of the English custom-houses, and so on[2]); at the same time unpunctuality is such a blot that wherever it occurs it obliterates all the good features of the service (for *finis coronat opus*), and disarms us of effective repartee.

Another good word may be thrown in for these unpopular companies, and that is to praise them for the plucky way in which they carry on their traffic during *fogs*. When an English railway is hard pressed it rises to the occasion and shows the stuff it is made of, and we are never so proud of our southern lines as during dense weather. Thus in the early weeks of last January (1889), when for eight or nine consecutive days the fog was so thick at times that a pedestrian could not see the curb of the pavement on which he walked, it was a truly English experience to stand on the platform of such a station as Norwood Junction, and hear the Brighton expresses thunder through with not so much as half the length of a single carriage visible at once. The pluck and endurance exhibited by obscure *employés* whenever 'fogging' is the order of the day are beyond words; an unappreciative public is whirled up to its office snug and warm, and

[1] Margate and back for 4*s.*, 180 miles (by S.E.R.), at 30 miles an hour including many stops, is not bad for an excursion; it is only on Sunday that the South-Eastern does such sensible Christian deeds.

[2] And therefore all the more honour to a company which, like the North-Western, can face the French in punctuality.

prefers to expend its admiration on those scarlet-coated heroes who are lucky enough to receive a scratch in the Soudan and a paragraph in the London papers.

FURNESS RAILWAYS.

GEORGE STEPHENSON first intended to take the Lancaster and Carlisle railway round by the Cumberland coast instead of over Shap Fells, but the idea lapsed again as the lusty young locomotives began to show their strength. Since then there has been no very high speed to disturb the shore from Whitehaven to Carnforth. However, with the recent extraordinary development of industry at Barrow, and the energy of the present executive, the speed as well as the general efficiency of the line have been raised to a higher standard.

In such a corner we can hardly expect 40 miles an hour, but one or two of the trains (*e.g.* Isle of Man Boat train from Midland) come so near that, considering the gradients, they are virtually express :—

BEST SPEEDS.

Miles	Between	No.	Time	Speed incl.	Speed excl.	
			H. M.			
28½	Carnforth—Barrow .	1	0 45	38	40¾	3.35 from Leeds [1]
	The quickest through train is :					
74¼	Whitehaven—Carnforth .	1	2 22	31⅓	36	7.30 P.M. from Whitehaven

This last, a semi-stopping train, runs faster than several trains on the Continent which charge 'first and second express' fares.

LANCASHIRE AND YORKSHIRE.

THIS might be called the 'Pennine' line, so much of its track winds up and down the valleys of that range. On this account it is impossible to expect the ordinary high average speeds of English railways, and wherever its route is more level the busy towns of Lancashire are so thickly studded on its course that they form an equal obstacle. To these natural drawbacks the company used to add the disfigurements of a slipshod management and disgraceful rolling-stock ; but the last decade has witnessed an immense improvement, and the executive are now as smart as on any line in the country. In 1884 they established the service of through quick

[1] This one we reckon as 'express' in the final summary.

trains between Liverpool, Manchester, and York (with carriages for Scarboro'), a service very convenient in itself, and useful as having a little brightened up the dull performance of the North-Western from Manchester to Leeds (the route by London and North-Western to Leeds gives 67 miles—quickest time two hours—from Manchester to York ; by Lancashire and Yorkshire it is 75½ miles). The Lancashire and Yorkshire possess, in the new Exchange terminus at Liverpool, one of the most perfect stations in the world, and must also be credited with their share in the huge erection at Preston.

Like most English railways, this company does not exert itself where stimulus is wanting. Thus between Manchester and Southport, having a route 15 miles shorter than the Cheshire Lines, they are able to give a shorter journey and yet never reach express speed ; this applies still more between Liverpool and Southport, where by running at 30 miles an hour they offer much the shorter trip.

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	Mileage	
			H. M.				
75½	Manchester—York.	6	2 7	35⅔	41½	453	12.15, 4.0 to York; 12.45, 2.45, 4.35, 6.35 to Manch.[1]
28¾	Liverpool—Bolton.	18	0 45	38⅓	41	517½	L'pool portions of the York trains, also local trains
35	Manchester—Southport.	2	0 55	38	39½	70	12 others average 61 minutes
48¾	Do. —Blackpool.	2	1 16	38½	39½	97½	4·45 and 6.0 up. (Talbot Rd., Blackpool)
51	Do. —Fleetwood.	2	1 20	38¼	39¼	102	12.40 (arr. *Douglas* 5.30) and 7.0 p.
44⅔	Do. —Lytham.	(4d) 6	1 7½	39⅓	40	268	Trains to and from Blackpool (Central)
		36		38	40⅔	1,508	

This is not a large total, but a very welcome one, since scarcely any of it existed five years ago. As for the speed, in this case the figures of *averages* give a most inadequate notion of the smartness of a service which has to make a series of spurts between close-packed towns or up forbidding valleys. The rolling-stock has improved as much as the speeds, and altogether the record is hopeful.

[1] There are 10 quick trains altogether, the other 4 averaging 2 h. 22 m. (32 miles an hour). The quickest of the 6 'express,' the 12.15 *ex* Manchester takes 1 h. 55 m., or over 39 miles an hour including stops. The quickest London and North-Western, the 12.15 from Manchester, reaches York at 2.15.

There are two English companies not yet quite 'express.' First, the

EASTERN AND MIDLANDS.

THIS single-line railway runs from King's Lynn to Norwich, with branches from Melton Constable to Yarmouth and Cromer. It comes under our notice here chiefly because of the enterprise it displays in developing Cromer, and especially for the way in which it works the King's Cross carriages between that seaside and Peterborough. In this distance of 84 miles it has to stop 6 times for passenger purposes, 12 more for exchanging 'staff,' one stop every 4½ miles on the average; yet it manages to attain, over considerable gradients, an inclusive speed of 30½ miles an hour, or as fast as we are sometimes allowed to go on the great thoroughfares of Europe when we pay 'first class only.' We therefore give this batch of trains, though they will not be counted as express.

Miles	Between	No.	Av. time	Speed		
				incl.	excl.	
			H. M.			
84	Peterborough—Cromer Beach .	4	2 50	29⅔	35½	quickest takes 2.45.

CAMBRIAN.

'THERE are no snakes in Iceland.' The Cambrian system of railways, extending from Whitchurch (London and North-Western) *vid* Machynlleth to Aberystwith, Barmouth, and Pwllheli, with an arm southwards from Moat Lane Junction to Brecon, has at present no train up to 'express' standard. The permanent way is good, and the gradients on the whole are moderate; but the traffic arising from a scanty population is not sufficiently nourishing to allow the company to indulge in the luxury of running even its through seaside trains in summer at forty miles an hour; too many stops have to be made for local purposes, and passenger carriages have to submit to drag goods wagons at their tail. Further, the Cambrian is of itself an isolated Welsh system, and, though serving a district extremely attractive to tourists, the amount of such through passenger traffic depends greatly on the energetic co-operation of the two big English companies (Great Western and London and North-Western) who abut upon it. A general dog-in-the-manger policy seems to be the present programme. Barmouth and Aberystwith are worse off as regards quick communication with the rest of the kingdom than any other popular seasides. Both North-Western however and Great Western appear to pose as rival vultures over

an expiring prey; but the Cambrian has of late discovered signs of new vigour.

The gradients are not unfavourable enough to allow the title of 'express' to any speed less than forty miles an hour: yet considering the circumstances referred to above, and the fact that the line is a single track, we cannot perhaps wonder that the following is the best

SERVICE.

Miles	Between	No.	Av. time	Speed	
				incl.	excl.
			H. M.		
75¼	Whitchurch—Machynlleth . . .	2	2 41	28	34½
59¾	Brecon—Moat Lane Junction . . .	2	2 17	26	30⅔

Refreshment bars are very frequent on the Cambrian, and as the shunting operations inseparable from a 'Mixed' train involve long delays, a journey over this system recalls memories of the old coaching days when inns were the leading features of the route.

GLASGOW AND SOUTH-WESTERN.

THIS small line deserves great praise for its spirited performance with the Midland expresses. Having a route 13 miles longer than the Caledonian between Glasgow and Carlisle, while the Midland again is 8 miles longer than the North-Western south of Carlisle, competition obliges it to strain every nerve for speed. The result is that, with a course nearly as severe as that of the Caledonian, it attains nevertheless a 'running average' third highest of all our lines, and actually one mile an hour better than the North-Western, which, except for the bit over Shap, has not a gradient worth mentioning (on its main lines).

From the table it will be seen that if the Midland expresses were taken away the company would boast only 40 miles 'exp.' mileage.

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed		Mileage	
				incl.	excl.		
			H. M.				
115½	Carlisle—Glasgow .	10	2 38	43⅜	46	1,155	
125⅝	Do. *viâ* Paisley .	1	3 17	38⅔	42	126	12.20 from St. Pancras
33	Carlisle—Dumfries .	2	0 42½	46½	46½	66	Stranraer boat trains —not 'exp.' west of Dumfries
40¾	Glasgow—Ayr .	1	1 0	40¾	42	40½	
	Total .	14	averaging	43½	45½	1,387½	

There is also a set of about a dozen fast trains between Glasgow and Ardrossan—31½ to 32 miles—taking an hour or a trifle less, with three or four stops; and two trains between Castle Douglas and Stranraer Harbour, averaging 32 miles an hour inclusive for the 54 miles.

BEST EXPRESS.

Miles		Time	Speed
		A.M.	
	Glasgow	10 25	
24½	Kilmarnock	10 58	44¼
		11 1	
82½	Dumfries	12 13	48½
		16	
115½	Carlisle	12 55	50¾

Inclusive speed = 46⅕ Running average = 48

CALEDONIAN.

When we get across the Border we leave behind us English notions of railway discipline, and come upon a very sorry state of things as regards punctuality and intelligent organisation. Scotch railway officials appear either to lose their head or to become helplessly rigid in the face of a traffic emergency, and it is only after bitter experiences of August or September platforms in Scotland that we learn to appreciate the sterling presence of mind of the common English porter, with his serene 'All right!' in the midst of wild confusion. From this tendency to demoralisation just when there is most need of grit the Caledonian and Glasgow and South-Western Companies are perhaps most exempt—though the former is liable to hysterics at Oban, and the delays at Larbert are an insoluble conundrum.

The Caledonian runs from Carlisle through Perth to Aberdeen, with branches from Carstairs to Edinburgh and Glasgow, and a romantic one of 80 miles from Dunblane to Oban. The greater part of its course lies over very stiff gradients, as is the case with all Scotch lines, and considering this the speeds are very good. Indeed, no one can do anything but praise the Scotch railways in general as regards *speed*: whenever a tough task of climbing is set before them they do it well, and the dawdling is on the easier sections.

The Caledonian has within the last year or two been strung up to a very much finer pitch of efficiency. The through trains from Perth and Aberdeen are considerably quicker, though heavier, than

five years ago. During the 'race' of last August it was the Caledonian which won highest honours of all the competing companies; to run repeatedly from Carlisle to Edinburgh in times varying from 102 to 105 minutes, a distance of 101 miles, over a summit of 1,015 feet, and another of 870, with nine successive miles of $\frac{1}{80}$ to mount, was certainly the most dazzling railway feat of that impetuous year.

The Caledonian branch from Dunblane to Oban deserves mention as one of the most remarkable in the country, both for the loveliness of its scenery, and for the apparent audacity of some of its engineering. The climb along the precipitous boulder-strewn slope of Glen Ogle (where it attains a height of 950 feet) can only be matched for dramatic effect by the Festiniog branch of the Great Western, where it winds with astounding curves among the dizzy cliffs near Trawsfynydd.

The new station at Perth is a very fine affair, one of the few in this island where the traveller may indulge in an excellent *bath*, and follow it up by a capital breakfast comfortably served. But the *booking office* is considerately placed at one extremity of the long block—a touch of nature so inscrutably Scotch as to baffle criticism.

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	Mileage	
			H. M.				
151	Perth—Carlisle. . .	4	3 44	40½	43	604	10.30, 8.0, 8.50 from Euston; 8.30 up
102¼	Glasgow— do. . . .	2	2 20	43¾	44¾	204½	10.0 from Euston; 9.5 P.M. up
101	Edinburgh—Carlisle. .	8	2 25	41½	44	808	3.12, 4.8, 5.22, 7.30 down; 10.0, 10.15, 2.20, 6.0 up
27½	Do. —Carstairs (over 870 ft.) .	3	0 43	38½	39¾	82½	Off 8.0 and 8.50 Euston; 9.10 P.M. up
18½	Glasgow—Law Junction .	1	0 27	41	41	18½	To join 8.30 A.M. from Perth
73½	Carstairs—Carlisle . .	3	1 49	40½	42⅖	220½	5.15 *ex* Euston; 7.30 P.M. Perth; 10.5 Glas. up
89¾	Perth—Aberdeen . .	2	2 20	38½	40½	179½	7.40 down; 4.40 up
21	Do. —Dundee. . .	9	0 30	42	42¾	189	5 *to* Dundee
45½	Edinburgh—Glasgow .	12	1 4	42⅔	44	546	Reckoned to the first suburban stop at Glasg.
68	Do. —Greenock .	2	1 45	39	41	136	7.0 A.M. *ex* Edin.; 5.25 P.M. up
	Total . .	46	averag.	41½	43⅕	2,988½	

BEST EXPRESSES.

Miles		Time	Speed
		P.M.	
	Carlisle .	4 8	
$100\frac{3}{4}$	Edinburgh .	6 0	54

This was the official timing from August 13 to 31, 1888, but the actual record was always better.

Miles		Time	Speed
		P.M.	
	Carlisle. .	5 15	
110	Larbert. .	7 38	46
		40	
118	Stirling. .	7 53	37
		56	
121	Br. of Allan .	8 2	30
		3	
123	Dunblane .	8 7	30
		8	
151	Perth { tickets	8 43	48
	{ station	8 45	

Inclusive speed = 43
Running average = 45

This is the new 10.30 A.M. from Euston; it is remarkable for the long run of 110 miles over the summit of 1,015 feet: between Larbert and Perth the road is also very steep.

NORTH BRITISH.

HERE is the company whose handling of expresses sheds anything but lustre on the Scottish nation. On the platforms of the Waverley station at Edinburgh may be witnessed every evening in summer a scene of confusion so chaotic that a sober description of it is incredible to those who have not themselves survived it. Trains of caravan length come in portentously late from Perth, so that each is mistaken for its successor; these have to be broken up and remade on insufficient sidings, while bewildered crowds of tourists sway up and down amongst equally bewildered porters on the narrow village platform reserved for these most important expresses; the higher officials stand lost in subtle thought, returning now and then to repeated inquiries some masterpiece of reply couched in the cautious conditional, while the hands of the clock with a humorous air survey the abandoned sight, till at length, without any obvious reason and with sudden stealth, the shame-stricken driver hurries his packed passengers off into the dark. Once off, the driver and the engine do much to make us forget the disgraceful rout from which we have just emerged, for the North British engines, especially those that work the Midland trains to and from Carlisle, achieve some of the very best express running in the world—over such hills. The fast trains across Fife are also smart enough, but it is on the almost dead level line between Edinburgh and Glasgow[1] that the

[1] Level except for the mile and a half of $\frac{1}{40}$ down into Queen Street from Cowlairs.

speed is disappointing. Great credit is taken for doing the 57½ miles between Edinburgh and Berwick in 75 minutes, without any stop to delay, and with the chief London express for stimulus; yet for years past the Great Northern have run (light trains) to and from Cambridge, 58 miles, in 75 or 77 minutes, over a route as hard and with two stoppages, each on ascending gradients.[1]

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	Mileage	
			H. M.				
57½	Edinburgh—Berwick (E. coast trains)	2	1 25	40½	41½	115	12.40 and 7.35 up. (See p. 35)
98¼	Edinburgh—Carlisle. (Midland trains)	6	2 29½	39½	41	589½	2 others av. 2.47 = 35⅓, very fine
45¾	Edinburgh—Glasgow	15	1 3½	43	44¼	686	Reckoned from Cowlairs. See note, p. 60
68	Do. —Helensburgh	2	1 42	40	42½	136	7.20 down; 5.21 up
29	Alloa—Thornton Junction	8	0 42½	41	43	232	
13½	Do. —Dunfermline.	3	0 20	40½	40½	40½	
	Total	36	averag.	41½	42⅜	1,799	

This is a poor amount, though some of the quality is first class. The opening of the Forth Bridge will no doubt make this company stand up and be a credit to itself when it at last possesses its own clear road right away to Perth and Dundee, and need no longer dread the humiliation of Larbert.[2] The North British will then, if it choose, have a rich prospect before it, and in the coming struggle with the Caledonian we shall probably see some express services in keeping with two such magnificent works as the Forth and Tay bridges—feats which rank second only to the Severn Tunnel.

At present the services between Edinburgh and Perth or Dundee are very slow :—

Miles	Between	No.	Time	Speed incl.	Speed excl.	
			H. M.			
69½	Edinburgh—Perth	3	2 9	32⅕	34¾	quickest 1.55 = 36¼
28½	Do. —Larbert.	12	0 54	31⅔	35	quickest 0.48 = 35⅔
48½	Do. —Dundee (*viâ* Burntisland)	5	2 11	22	—	this includes five miles of ferry—quickest 2.8
47	Edinburgh—Perth *viâ* Ferry, Ladybank, Bridge of Earn	—	—	—	—	several about 2½ hours

[1] It is true the Scotch expresses are worked by *North-Eastern* engines and men; but on English soil the North-Eastern would smile at the idea of 46 miles an hour being excessive speed, on such a moderate course.

[2] Along with the Forth Bridge a short bit of line—the Glenfarg railway—is being made from a little way north of Kinross direct to Perth; then Perth will be slightly over 40 miles, or one hour's journey, from Edinburgh.

BEST EXPRESS.

Miles		Time	Speed
		A.M.	
	Carlisle	3.33	42
98¼	Edinburgh	5.53	

This is the 8.25 'Tourist' from St. Pancras—a grand break, without a stop, over two distinct summits of 950 and 850 feet, up many miles of $\frac{1}{70}$.

HIGHLAND.

From Perth to Wick as the crow flies is about 120 miles, but 305 by the metals of the Highland Railway. The excess is caused by big detours to avoid mountains, and by tortuous coasting round inlets of the sea. Except in summer there is scanty passenger traffic, but throughout the year one good train is run each way. This leaves Perth at 7.50 A.M., reaches Inverness at 11.50 (stops 20 minutes there), and arrives at Wick 6.10. The up train leaves Wick at 8 A.M., Inverness 3.0, arriving at Perth at 7 P.M. These two runs of 4 hours between Perth and Inverness, 144 miles, are as much entitled to the name 'express' as anything in England. The train is a heavy one,[1] the line is single all the way, and it climbs over a summit of 1,476 feet. We doubt if there is any higher speed anywhere than that which occurs daily on the descent between Dava

[1] In July and August this 7.50 train is the unique railway phenomenon. Passenger carriages, saloons, horse-boxes, and vans, concentrated at Perth from all parts of England, are intermixed to make an irregular caravan. Engines are attached fore and aft, and the procession toils pluckily over the Grampians. Thus on August 7, 1888, this train sailed out from Perth composed as follows:—

L.B.S.C.	horse-box
,,	,,
,,	carriage van
,,	horse-box
L.N.W.	,,
N.E.	,,
L.N.W.	saloon
,,	horse-box
Mid.	saloon
,,	luggage van
,,	carriage truck
,,	horse-box
L.N.W.	,,
N.B.	luggage van
,,	horse-box
,,	,,
,,	,,
E.C.	sleeping car
G.N.	saloon
W.C.	composite
Mid.	composite
L.N.W.	luggage van
L.S.W.	horse-box
W.C.	composite
L.N.W.	horse-box
,,	meat van
H.Ry.	P.O. van
,,	luggage van
,,	third class passenger
,,	first ,, ,,
,,	second ,, ,,
,,	third ,, ,,
,,	luggage van
,,	third class passenger
,,	first ,, ,,
,,	third ,, ,,
,,	guard's van
9 companies	36 carriages

2 engines in front, 1 put on behind at Blair Athol.
Left Perth 20 minutes late. Left Kingussie 72 minutes late.

and Forres; if there is, we should prefer to take it on trust. The remainder of the journey, between Inverness and Wick (and Thurso), is quite meritorious, for the track in this remote region heaves up and down like a turnpike road. In winter the snow drifts are more appalling than the gradients, and it is certainly creditable to all concerned that through our darkest weather Wick can rely upon being only 22 hours from London, a distance of 756 or 768 miles by west or east coast routes respectively.

EXPRESS SERVICE.

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	Mileage	
			H. M.				
144	Perth—Inverness .	2	4 0	36	38½	288	over chief summit of 1,476 feet.
			Fast.				
161¼	Inverness—Wick .	1	6 0	27	30		handicapped by fish wagons, incessant gradients and stoppages.
	Wick—Inverness .	1	6 30	24¾	28		

The *third class* carriages of these Highland express trains are equal to the very newest of the wealthiest English companies—are perhaps unequalled in the item of space between opposing knees.

But the utter absence of discipline at important stations defies description or explanation. The arrival or departure of a through train seems to be the signal for a general paralysis of common sense amongst all the station staff, who, instead of organising themselves to grapple with the crowd, at once lose heads or temper, and stiffen into philosophic apathy, until Time, of whom they never weary, brings their trouble slowly to an end. Why should we embark in our orderly thousands at Euston to be re-embarked a rabble at Edinburgh, Perth, or Inverness?

GREAT NORTH OF SCOTLAND.

THIS small and rising company holds the north-east corner of Scotland, its main line running north-west from Aberdeen to Elgin, where it meets the Highland. It has a traffic compactly placed, and its general service—much improved the last year or two—is most praiseworthy; but it does not as yet contribute quite an 'express,' even allowing for the fact of single line and hilly gradients. The best trains are:

Miles		No.	Av. time	Speed		
				incl.	excl.	
			H. M.			
87¼	Elgin—Aberdeen . .	1	2 35	34	35½	10.10 up
53¾	Keith— Do. . .	1	1 36	33½	35½	10.10 down
43½	Aberdeen—Ballater. .	2	1 17½	38⅔	35¾	

These last are ordinary trains; the 'Queen's Special,' having no stops to make, occupies 1½ hour each way.

The longest run on the Great North is from Huntly to Aberdeen, 40¾ miles in 68 minutes, or 36 miles an hour, an improvement of 42 minutes on 10 years ago.

IRELAND.

THIS extraordinary island, with a population of 5,000,000, has *two* express trains. We therefore hasten to secure them :—

GREAT SOUTHERN AND WESTERN COMPANY.

Miles	Between	No.	Av. time	Speed		Mile-age	
				incl.	excl.		
			H. M.				
165	Dublin—Cork .	2	4 5	40⅘	42	330	1st and 2nd class. Mails to and from Queenstown. There are 2 others take 5¼ hours = 31½ incl.

During this winter a new express has been inaugurated between Cork and Limerick Junction, G.S. & W.

These two, it will be noticed, run through the quickest-witted portion of the island. The northern part, having only eleven miles of water to separate it from Scotland, and boasting Scotchmen for its chief inhabitants, can hardly be expected to show much enthusiasm on the subject of railway smartness. Their best trains are these :—

GREAT NORTHERN OF IRELAND.

Miles	Between	No.	Time	Speed		
				incl.	excl.	
			H. M.			
113	Dublin—Belfast. .	2	3 0	37⅖	40	1st & 2nd cl. Mails (8 others average 4¼ hours)
34	Omagh—Londonderry	2	1 0	34	35	
41¼	Do. —Portadown .	2	1 16½	32⅔	33¼	

BELFAST AND COUNTY DOWN.

27	Belfast—Downpatrick.	One down three times a week, taking 45 minutes; no stops, or 36 miles an hour.

Miles	Between	No.	Av. time	Speed incl.	Speed excl.	
	BELFAST AND NORTHERN COUNTIES.					
68	Belfast—Portrush .	—	H. M. —	—	—	One down Sat. and back Mon. taking 2 hours, with 10 min. stops, or 34 miles an hour incl., 37 excl.
34	Do. —Ballymena .	1	1 0	34	35	3 others av. 1.10 = 29 miles per hour
25	Do. —Larne Harb.	1	0 45	33⅓	40	Stops to take up for boat
	MIDLAND GREAT WESTERN.					
125	Dublin—Galway .	2	3 50	32⅔	35¾	1st and 2nd cl. exp. fares (Continental)

The two next best take 5¼ and 5½ hours, or 23 miles an hour.

The one spark of light therefore greets us on the Southern and Western line to Cork. The intermediate speeds here are very brisk, and the fast trains very heavy. Third-class accommodation is superior to that on many English lines—though *the* expresses are 'first and second only.' On Sunday the Mail leaves Dublin at 7.20 A.M., reaching Cork 11.7 (first class only), an inclusive speed of 43⅔.

The Irish gauge is 5 feet 3 inches. It is a pity there are not a number of light lines laid down, as the poorer districts might bear the cost of such cheap railways, and the speed need not be less than that prevailing now as a rule. The average Irish farmer is many times as far from a railway station as his English rival.

SUMMING up the results of the foregoing pages, we get this as the

EXPRESS MILEAGE OF GREAT BRITAIN,

arranged in order of best average speed, excluding stops.

No. of trains	Company	Speed		Per cent. of 3rd class to total	Total mileage
		Incl. stops	Excl. stops		
	ENGLAND.				
93	Great Northern	43 4/5	47	all	9,544
97	Midland	42 2/3	46 1/4	all	11,381
135	North-Western	41 1/2	44 2/3	94	14,436
23	Great Western	40	43 3/4	75	3,904
6	London and South-Western	41 2/5	43 2/3	all	1,325
39	North-Eastern	40	43 5/6	all	4,083
46	Manch. Sheffield & Lincs.	42	43 1/4	all	2,106
2	Hull and Barnsley	39 1/2	43 1/3	all	105 1/2
9	Chatham and Dover	41 1/2	43	22	706
2	Tilbury and Southend	43	43	1 & 2 cl., but 2nd is only 1*d.* per mile	71 1/2
52	Great Eastern	40 3/5	42 5/6	all	4,171
14	South-Eastern	42 2/3	42 2/3	30	1,180
17	Brighton	42	42 1/4	48	1,562
36	Lancashire and Yorkshire	38	40 3/4	all	1,508
1	Furness	38	40 3/4	all	29
	SCOTLAND.				
14	Glasgow and South-Western	43 1/3	45 1/3	all	1,387
46	Caledonian	41 1/2	43 1/5	all	2,988
36	North British	41 1/2	42 2/3	all	1,799
2	Highland	36	38 1/2	all	288
	IRELAND.				
2	Great Southern and Western	40 2/5	42	none third	330
672	Total	41 2/3	44 1/2	93	62,904

It is almost impossible to re-arrange this Table so as to show the exact relative merit of the various companies. It would not do to rank them according to the proportion borne by their total express mileage to *the entire length* of their system, because in some cases only a small, and in others a very large part of the entire length consists of local branch lines, on which no expresses are required. Nor is that company most to be praised which runs most expresses in proportion to the *population* of its district, because a densely-packed population (*e.g.* Lancashire, Black Country, Londoners) need not travel long distances, *i.e.* need not demand many 'express' trains.

If, however, we pick out in the case of each company *those sections of line alone* over which it runs expresses (shown *coloured* in our Map of Great Britain), and adding these sections together consider their sum as the real length of each system for our purpose, then if we arrange the companies according to the proportion which their total express mileage bears to this essential length of system, we have a Table that does give some idea of the relative brilliance and enterprise of the different lines:—

Length of entire system in miles	Company	Length of portions over which expresses run	Daily express mileage	Resulting multiple
977	Great Northern	290	9,544	33
1,874	North-Western	710	14,436	$20\frac{1}{3}$
1,296	Midland	690	11,381	$16\frac{1}{2}$
287	Manch. Sheff. and Linc.	130	2,106	16
1,578	North-Eastern	340	4,083	12
476	Brighton	175	1,562	9
348	Glasg. and S. Western.	155	1,387	
949	Great Eastern	480	4,171	$8\frac{2}{3}$
418	South-Eastern	135	1,180	
511	Lanc. and Yorkshire	190	1,508	8
784	Caledonian	420	2,988	7
180	Chatham and Dover	100	706	
2,460	Great Western	636	3,904	6
1,027	North British	315	1,799	$5\frac{2}{3}$
866	South-Western	280	1,325	$4\frac{2}{3}$
425	Highland	144	288	
66	Hull and Barnsley	$52\frac{3}{4}$	$105\frac{1}{2}$	2
68	Tilbury and Southend	$35\frac{3}{4}$	$71\frac{1}{2}$	
522	Gt. S. and W. (Ireland)	165	330	
139	Furness	29	29	1
15,083		5,397	62,904	$11\frac{2}{3}$

To illustrate the startling growth of our fast trains within *the last twenty years*, we extract the following results from Lieut. Willock's paper:—

TOTAL NUMBER OF TRAINS WITH A SPEED EXCEEDING 'THIRTY-NINE MILES AN HOUR INCLUSIVE' IN THE YEAR 1871.

On the	No.
Great Northern	14
Midland	9
Brighton	7
Great Western	6
North-Western	5
North-Eastern	5
South-Eastern	4
Chatham and Dover	4
South-Western	2
Great Eastern	1
Total	57 (i.e. $\frac{1}{12}$ of the no. in 1888

At that time a train was considered 'express' if its 'inclusive speed' was as high as '36 miles an hour.' But even adopting this standard, and admitting 25 trains which fell below it because of hilly route, Lieut. Willock could obtain no more than a total of 250 expresses at that date, viz:—

On the	No.
North-Western	45
Midland	32
Great Northern	31
Great Western	28
North-Eastern	27
South-Eastern	15
Caledonian	15
North British	14
Brighton	12
Manchester, Sheffield, and Lincoln	11
South-Western	7
Chatham and Dover	6
Glasgow and South-Western	4
Great Eastern	3
Total	250

(The reader will note the change that has come over the *Great Eastern* since that time.)

We now set side by side the results of the three censuses already made:—

In	There were	With an average speed		Running daily Miles
		incl. stops	excl. stops	
1871	250 expresses	37¾	40·4	23,700
1883	409 Do.	41⅝	44·3	42,600
1888	672 Do.	41⅝	44·5	62,900

It will be observed that the *average* speed has not increased in the last five years; this is mainly because so much of the increased mileage consists of trains which have just worked themselves up to the 'express' standard.

If we multiply the total mileage by the 'inclusive speed' for each of these three years, we get figures showing the increased advantage to the public:—

	Product	i.e.
1871	891,120	9
1883	1,772,160	18
1888	2,620,410	26

The improvement was somewhat sudden after 1871, yet we see that it is now proceeding at the same rate.[1] And in the face of these

[1] 1888 was a particularly exceptional year. During that summer the 'express' mileage of Great Britain shot up nearly 6,000 miles in amount,

facts there are people who feel sure the railways are no better than they were some years ago, at any rate as regards 'cross-country' facilities; whereas a large proportion of the increased mileage is contributed by cross-country 'expresses,' a novelty unknown ten years ago.

The figures 9, 18, and 26, just given, do not adequately represent the increased public advantage. For by the year 1883 the average express had become half as long again—and twice as populous—as in 1871, so that many more passengers were carried for each mile of the mileage shown, and thus the multiplication of services was much greater than we make it appear. Nor does this consideration exhaust the improvement. The last twenty years have witnessed a revolution in the *comfort* of each of the increased number of passengers. What with third-class cushions and room for our knees, hat-racks and foot-warmers, smooth steel rails and the easier carriage springs that followed, with bogie trucks and differential axles, we are whirled along now so unexcitedly that we hardly realise the pace. But this is not all; for express journeys have improved in *safety* as much as in comfort, since the almost universal adoption of the 'block' system, interlocking of signals, and continuous 'automatic' brakes. To put the case fairly then, we must say that in 1888 express travelling had grown to four times per head what it was in 1871,[1] and that this quadrupled facility has been accompanied by an increase of comfort and safety beyond expression in figures.

Things would hardly have been better had our railways all been 'under Government.'

As to the efficient cause of these 'leaps and bounds' which have taken place since 1871, we quote from the introductory remarks of Lieut. Willock's paper:—

(1.) The *Midland* obtained access to London by its own line.

(2.) The Midland in 1872 admitted third class passengers into express trains.

(3.) Other companies soon did the same.

(4.) Hence much longer trains; and also as competition increased more commodious, and consequently heavier, carriages were introduced.

(5.) Then heavier and more powerful engines had to be constructed to draw these trains, and were made directly.

(6.) This spur to locomotive improvement made still higher speeds (even with the increased weight of trains) possible, and competition eagerly seized this possibility.

chiefly owing to a burst of competition for Scotch traffic. (The Rev. C. E. Graves points out that the bulk of our express improvements have occurred in *leap year*, viz. 1872, 1876, 1880, 1884, 1888.)

[1] The population having increased about 40 per cent.

SOME EFFECTS OF EXPRESS SPEED.

WE have only room for a thumb-nail sketch, but we should not dismiss our statistics without a word as to the influence exerted on a country by the constant stir of cheap and rapid locomotion.

The number and speed of the express trains of a country is not an unimportant circumstance. It is quite as pregnant as many smaller facts which compel the reader's respect because they are called 'phenomena.'

Like any other phenomenon, the remarkable one of English railway speed must have a parentage. It shows national 'grit' to maintain such a host of trains exceeding 'forty miles an hour inclusive,' and every extra mile of speed above the 'forty' indicates extra good stuff in the composition of the natives. Just as rods of iron scarcely feel a strain up to a certain point, after which they quickly break, so in foreign countries 'forty miles an hour inclusive' marks the 'breaking-point' of the management. But the summer of 1888 saw *added* to the existing English total 5,000 miles of new 'exp.' mileage of a quality so high that the entire Continent does not produce so large a total absolutely. However, as it is our own country where these tense speeds are commonplace, we will not pursue the topic farther.

Many, if not most, of the distinctive phenomena that constitute 'the nineteenth century' are directly due to railway speed; that is, we can scarcely imagine the possibility of their development in the absence of railways. As shrewd Mr. Edward Pease said seventy years ago, 'Let the country but make the railroads, and the railroads will make the country'; and they *have* made the country, for better or worse, moulded the leading features of its national life. Let us glance at a few haphazard instances.

First, for people who are nothing if not Socialistic, consider the unexampled *diffusion of wealth* in the last forty years; an unexampled *diffusion*, however striking may be the contrast still between the very rich and very poor. This is shown by the wonderful approach towards uniformity of *prices* in different parts; goods instantly move from where they are most plentiful, and this quicksilver action could never have occurred before railways.[1] Railways have made everything *common*.

And the people of different localities are getting to vary almost

[1] Of course cheap steel ships and 'triple-expansion' marine engines have lately lowered freights (and therefore prices) as much as railways; still most of the goods *begin* their journey *inland*, and have to wait for railways to start them.

as little as the prices; there is a uniformity of 'common' manners, it is said. The immediate effect does seem to be this. Still, railways have introduced *freedom*, and from this will, later on, develop unimagined *individuality*. When 'a penny a mile' came in all feudal links with the past were snapped, including the traditional deference to surroundings from which one saw no means of escape; the abrupt freedom has produced an 'independence' of manners which is no doubt 'commoner,' but perhaps not more unsatisfactory, than the laboured insincerity of former times. The railway has made the poor 'stand up to' the rich much as Luther stirred the nations to defy the Church.

This modern freedom must be held responsible for a great deal of our 'realistic' tendency in art and behaviour; people demand the genuine and true rather than the picturesque or sentimental.

Then the unprecedented growth of *population*. Free Trade has stepped in here and played Jacob with the birthright of railways. However 'free' trade had been made, to what extent could it have expanded without the launching impetus of railways? Previous to 1830 the roads leading from Manchester to Liverpool were blocked, not by tariff, but by want of carrying power. At least three-fourths of the enormous increase in our commerce since 1850—by which date most of our trunk lines were in operation—should be credited to railways; but 'Free Trade' was contemporaneous, and since it was a Government stroke, dramatic and visible to all, it eclipsed the influence of its humdrum though mightier rival. Free Trade without steam would not have stirred the pool very much.

Inseparably connected with the growth of population is *the astounding cheapness of most necessaries*. The materials of *food* and *clothing*, being bulky, and rural products, depend entirely on cheap transit for a practical price; and our imports of these coming chiefly from regions where railways are making great strides, are arriving more profusely every year.

We might refer to the universal and sometimes frenzied spirit of *competition*—which of itself would separate this century from its predecessors—as another familiar instance of what railways do. How much competition would be left if railways went? Again, cheap *books* and *newspapers* depend on population and on railways for a sale sufficiently large to enable them to be sold so cheap. This prevalence of print conduces to *claptrap*, because the large audience is more hungry than nice; and from living in an age of print many of our most ordinary habits or acts assume a theatrical rouge, by passing under the yoke of the 'reporter.' Every small boy expects to see his half-holiday score at cricket duly figure (or cypher, as the case may be) in the columns of his local paper.

There are bigger things left. Who can help being struck by the

tolerance of our age, a tolerance astounding when contrasted with the mental brutality of sixty years ago? The incessant shuttle of railway speed, the myriad daily encounters of all sorts and conditions of men owing to this cheap expedition, the resulting flux and murkiness in place of definite conviction, the unambitious content as long as one can find some *modus vivendi* amongst such heterogeneous diversity—this peculiar characteristic of the time (its weakness and its strength) is the special outcome of express trains. Bismarckism would have no chance in England; if it thrives in Germany perhaps the explanation in part appears on pp. 169–172.

From this restless diffusion of men arises a growing *complexity* of social problems; no more of the simple parish under despotic paternal government. Now all our various programmes interact—we are no longer autocrats on our own instrument, but have to observe *orchestral* behaviour; and any difficulty becomes more and more an orchestral disaster.

Then there is hope in the air, a new optimism, fed chiefly by perpetual motion. Constant change of place and circumstance, instead of the old local monotony, has infused new blood into the race; there has been repeated cross-breeding with the 'infinite variety' of the world, and a tonic is at work within. Partly from this better modern 'temper,' and partly because of the tolerant mood before mentioned, the present generation is accused of no deep feeling. The fact is they will not be crushed, and they resent the worship of Tragedy, because the *new hopefulness* makes them think that many tragedies belong to the class of preventible accidents.

This healthy tone has been bred not only by the daily influence of railways, but by the annual practice of 'going to the seaside,' or making a tour, a practice undreamt of before railways, and now endemic. From these same yearly tours have been developed the instinct for 'scenery,' an article for which there was no general demand before George Stephenson.

'So that, standing on the platforms of our great inland stations, we watch a salutary stir in the ebb and flow of restless men; we see men under treatment by Motion, and know there is a chance for them. Over every railway station the flag of Hope waves bright, while day after day the befriending express moves in and out on its errand of health. What the sea does once a year to freshen individual lives our railways are doing every day for the national life, in a way less picturesque but none the less effective.'

We must not pass by our two latest and most fashionable phenomena. First, the 'emancipation of Woman.' Without claiming that this movement arose directly from the opening of railways, we may firmly maintain that it has been greatly strengthened by the mere fact of railway travel. Women are so tightly moored by

Nature that if locomotion is also for them an impossibility they must indeed feel slaves. Compare the portentousness of a hundred miles journey for a girl last century with the ridiculous ease of travel now, and we see how they cannot bask in the new freedom long without tingling to assert their own individuality. 'Home-keeping youths have ever homely minds.'

Lastly, the present agitation for 'Bimetallism,' whether as a medicine for low general prices or for low agricultural prices in particular, must be attributed to railways. Raw materials fall in price with every extension of railway mileage in the new countries, and manufactured goods are cheapened by the growth of the quantity exported, which depends largely on railways at home and abroad.[1] Here again, as with Free Trade in 1846–50, the Franco-Prussian War has been credited with the work of other agents because these others are familiar and continuous in their operation.

In such good company we cannot do better than leave our railways. But if it is true that they have these high social connections, if express trains are the efficient cause of some of the most distinctive features of nineteenth century civilisation, there must be more than ordinary interest in examining the relative strength of this factor in various parts of the world. Some people say Ireland is 'scarcely civilised;' it certainly has scarcely any express speed.

[1] We are not pretending that railway extension is the only factor in cheapening commodities, for Bessemer steel by cheapening machinery has cheapened all manufactured goods in the last twenty years, and 'compound' marine engines have largely lowered freights by sea; still railways seem the critical factor, because they *begin* the transfer, and until they are open the traffic cannot be precipitated on its course. These causes affect English prices most, because we are the greatest importers. And these three powerful forces have only burst out into action during the last twenty years.

PART II.

FOREIGN EXPRESS TRAINS.

A modern Hotspur
Shrills not his trumpet of 'To Horse! to Horse!'
But consults columns in a Railway Guide,
A demigod of figures, an Achilles
Of computation.
A verier Mercury, express come down
To do the world with swift arithmetic.

DIPSYCHUS.

NORTH AMERICA.

August 1888.

(Figures taken from the *Traveller's Official Guide.*)

In dealing with the expresses of the United States it is somewhat difficult to know what standard to take. As, however, the best Eastern roads approximate very closely to those of our country in equipment, and also because with the data at our disposal it would have been extremely difficult to take a lower standard with any approach to accuracy, we have taken 40 *miles an hour including stops*, as our definite express train, and have allowed nothing under this.

It must not, however, be supposed for a moment that we consider this test as absolute in any way. In fact, there are a very large number of trains in the Eastern States at 38–39 miles an hour, which are most creditable, and in the Western States there are vast quantities of runs at 35–38 miles an hour, which are really marvellous performances considering the character of the track (generally single) and the sparse population. Mr. Hadley has shown that the proportion of passenger train miles to population is greater in the States than anywhere else in the world, and, if we except Great Britain, the same would be easily the case with regard to *express miles*.

But it would be almost impossible for any foreigner to do justice to these, and so we have had to be content with just the top performances.

Even now we fear that, in the vast mass of confused and ill-arranged time-tables, we may have overlooked some performances which reach our ideal. It will be noticed that the Pennsylvania Road contributes 44 per cent. of the total. The average American fare per mile was in 1884 1·17*d.* on the ordinary cars; but though professedly there is only one class, almost all the express trains contain Pullman or drawing-room cars at extra fares.

It may be said that as a rule American trains and engines are heavier than ours, while the rails are lighter. All cars and engines are on bogie trucks, and each car weighs from 55,000 to 60,000 lbs., while ours weigh from 18,000 to 45,000 only.

Of course, the question of the average weight of train is almost impossible to settle, but it may be said that in England it is the rarest thing to see any express train with more than 20 six-wheeled

vehicles drawn by one engine (we believe the 8.45 from Brighton is the only one habitually exceeding this limit), while in America expresses with vehicles equivalent to 20 or 26 of ours are common.

GENERAL FIGURES OF EXPRESS MILEAGE.

	Speed, including stops	Total express miles
Canada	41	129
United States	41⅖	13,956

Taking the population of the United States as 61,000,000, we get one express mile per diem to 4,360 inhabitants.

CANADA.

BEST EXPRESS.

GRAND TRUNK RAILWAY.

Miles		Time	Speed
		P.M.	
	Windsor	1 40	
45½	Chatham	2 49	39⅘
		50	
110	London	4 25	41
		30	
129½	Ingersoll	5 1	38
		2	
138½	Woodstock	5 19	32
		20	
157½	Paris	5 49	39½
		50	
167	Harrisburg	6 3	43
		7	
185½	Hamilton	6 35	25
		40	
218	St. Catherine's . . .	7 33	36
		34	
229½	Niagara Falls . . .	7 55	33

Speed, including stops = 36⅘. Speed, excluding stops = 38¼.

If our figures are right, this is a very curiously timed train. There is another train in Canada almost as good run by the Canadian Pacific, viz., Ottawa to Montreal, 120 miles, in 3½ hours, speed inclusive 34, exclusive about 37. The names of London and Paris seem hardly to evoke speed ; indeed, there is one train which runs from London through Paris without stopping, yet only attains 35 miles an hour.

UNITED STATES.

IT is rather difficult to assign to any one train the merit of 'the best express.' The long distance New York-Chicago trains of the

Pennsylvania and the New York Central Companies are highly meritorious, and so is the Portland and Bangor express of the Maine Central. All these, however, are limited trains at extra fares. The fastest running is from Baltimore to Washington, 40 miles in 45 minutes, 53⅓ miles per hour. Besides these, distinctly the best running in the States is made between Jersey City and Philadelphia, and between Boston and Providence. Between the two rival lines from New York to Philadelphia the race is very even. Over this

BEST EXPRESSES.

Bound Brook Route.

Miles		Time	Speed
		A.M.	
	Philadelphia .	7 30	
	Columbia Av..	7 34	
	Wayne Junc. .	7 39	46·6
		40	
31·1	Trenton Junc..	8 12	
		13	52·4
58·2	Bound Brook .	8 44	
		45	50·6
89·4	Jersey City .	9 22	

Speed, incl. stops = 47·9
„ excl. „ = 49·8

Pennsylvania Route.

Miles		Time	Speed
		P.M.	
	Jersey City .	4 13	
55·75	Trenton . .	5 16	53·1
		17	
84·10	Germantown Junc. .	5 52	48·6
		53	
89·76	Philadelphia .	6 5	28·3

Speed, incl. stops = 48·85
„ excl. „ = 48·96

NEW YORK AND CHICAGO LIMITED EXPRESSES.

Pennsylvania Route.

Miles		Time	Speed
		A.M.	
	Jersey City .	9 15	
89·76	Philadelphia .	11 13	45½
		20	
195	Harrisburg .	1 55	40½
		2 0	
327	Altoona .	5 15	40½
		20	
443	Pittsburg—		37
	East. time .	8 30	
	Central time	7 45	7
444	Allegheny .	7 54	
		55	34
526	Alliance .	10 20	
		25	33½
632	Crestline .	1 35	
		40	40
762	Fort Wayne .	4 54	
		5 0	38½
909	Archer Avenue	8 49	
		50	12
911	Chicago .	9 0	

Speed, incl. stops = 36·80
„ excl. „ = 38·09
9 breaks averaging 101 miles each.

New York Central and Lake Shore Route.

Miles		Time	Speed
		A.M.	
	New York .	9 50	
143	Albany . .	1 10	42⅘
		15	
290½	Syracuse .	4 50	41⅕
		55	
371⅓	Rochester .	6 50	42
		55	
441	Buffalo—		42
	East. time .	8 35	
	Central time	7 45	
529	Erie . .	9 50	42
		55	
624	Cleveland .	12 10	42
		15	
737	Toledo . .	3 22	36¼
		25	
870	Elkhart .	6 45	39⅘
		50	
971	Chicago .	9 50	33⅓

Speed, incl. stops = 38·84
„ excl. „ = 40
9 breaks averaging 108 miles each.

ground there are 26 expresses by the Pennsylvania averaging 42 miles per hour, and only 14 by the Bound Brook route averaging 41½, but, of course, the Pennsylvania has more population behind it than the other route. As regards the New York and Chicago express trains, though the Pennsylvania route is 60 miles shorter, both routes take the same time, and thus the finer performance is that of the New York Central. It should be noted that we have not got the official time of rest at stations of the latter, as it is put down to arrive and start at the same moment at intermediate stations—clearly an impossibility.

Both are heavy trains, weighing about 290,000 lbs., and on both extra fare is charged. The long duration of run without a stop, 3 to 3½ hours, is specially noticeable. From Penzance to Wick is our chance of a similar journey at home ; 957 miles done at just about the same speed, excluding stops, but owing to the quantity of these taking six hours longer. But from London to Perth over similar hills it is 7 miles further than from Jersey City to Pittsburg or from New York to Buffalo, but we have 6 trains a day 60 minutes quicker than the 'Limiteds' of the States, all carrying third class passengers.

The long car of the United States, with every convenience on board, enables stops to be reduced to a minimum. The 'Limited' express of the Pennsylvania Road is said to be the most luxurious train in the world, and contains even a barber's shop on board. Even if in our small island such trains would prove useless, it is to be wished that the continental railways would provide them at fares as moderate as in the States, since for long distance travel they are undoubtedly more comfortable. The P.L.M. of France are said to be building a set of these cars to run between Paris and Geneva without extra charge.

BOSTON AND MAINE R.R.

BEST EXPRESS.

Miles		Time	Speed
	Boston & Maine.		
		A.M.	
	Boston	9 15	
51	Exeter	10 33	35
		35	
104	Old Orchard Beach . .	11 54	40
		55	
116	Portland	12 15	36
	Maine Central.		
116	Portland	12 20	
252·6	Bangor	3 30	43·1

	Boston & Maine	Maine Central
Speed including stops =	38·6	43·1
Speed excluding stops =	38·7	43·1

This railway should be held up as a beacon, not as an example, for the two Mount Desert expresses only average 38⅔ including stops, and yet we find the magic inscription on these by no means dangerous trains 'Extra fare charged.' It will be observed that the portion run over the Maine Central is real express, which is our reason for giving it here.

The only two other expresses which shall be specially mentioned here are those between New York and Boston and between Washington and Baltimore.

BEST EXPRESSES.

NEW YORK & BOSTON.

1. *viâ Springfield.*

Miles			Time	Speed
			P.M.	
	N.Y., N.H. & H.	New York . . .	4 0	
73		New Haven . . .	5 50	40
			55	
92		Meriden	6 21	44
			22	
110		Hartford	6 48	41½
			50	
136		Springfield . . .	7 27	42
	B. & A.		31	
190		Worcester . . .	8 54	39
			57	
213		South Framingham .	9 28	44½
			29	
234		Boston	10 0	40½

Including stops = 39 Excluding stops = 40⅗

2. *Shore Line.*

Miles			Time	Speed
			P.M.	
	N.Y., N.H. & H.	New York .	5 0	
56		Bridgeport .	6 25	39½
			26	
73		New Haven	6 53	38
			55	
105		Saybrook .	7 40	42½
			41	
124		New London	8 10	39
	N.Y., P. & B.		15	
168		Wickford J.	9 27	36¾
			28	
188		Providence	9 55	44
			10 0	
232	O.Col.	Boston .	11 0	44

Including stops = 38⅘
Excluding stops = 39⅘

3. *Air Line.*

Miles			Time	Speed
			P.M.	
	N.Y. & N.H.	New York .	3 0	
73		New Haven	4 55	38
			5 0	
97		Middletown	5 39	37
			40	
127		Willimantic	6 37	31½
			40	
	N.Y. & N.E.			
				37
213		Boston .	9 0	

Including stops = 35⅗
Excluding stops = 36⅗

That the speed is not higher seems to be due to the lack of competition, all these routes being virtually subject to the New York New Haven and Hartford line, which alone holds the entrance to New York. These trains return by the same routes at the same times and speeds.

Almost the only other first rate expresses are those run between Baltimore and Washington by the 'B. and O.' road; two trains each way daily doing the 40 miles in 45 minutes without stop, or 53⅓ miles per hour, which we believe to be actually the fastest running in the States. They are, moreover, almost the only 'expresses' run at all by the powerful 'B and O.'

Many lines where we should expect to find good speeds run no technical 'expresses'; for instance, the New York, Lake Erie and Western on its 'Chicago and St. Louis limited' takes 12¾ hours from Jersey City to Buffalo 422 miles, speed inclusive only 31. Again, great as is the reputation of the Boston and Albany, we have to be very indulgent to find an 'express' at all; there is none between the two terminal points Boston and Albany, and only one (one way) between Worcester and Springfield. It must, however, not be forgotten that the entrance to many American towns has to be traversed at very low speeds, as the railways are unfenced, running indeed in many cases along the public roads, while intermediately speed has often to be reduced where a railway is crossed on the level, so that the running speeds may be first rate, although the 'throughout' speeds *look* poor on paper. Still, our object is to show how quickly a train, and by it a passenger, gets from one point to another, so that we do not take this into account.

A good deal of amusement may be got out of the American time-tables. We find, for instance, the high sounding title, 'Staten Island Rapid Transit Railway.' But its fastest train—New York to Perth Amboy—takes one hour fifteen minutes to do the 20 miles, just 16 miles an hour, which is almost an Italian speed.

Then an announcement of the Oregon Railway and Navigation Company runs thus: 'Mixed trains have accommodation for passengers, who wish to assume the additional risk of accident'—clearly implying the terrors of such a journey.

In the Western States there is not much to note, but the Union Pacific's 'Overland Flyer' is quite first rate. It does the 1,031 miles from Omaha (1,000 feet above sea-level) to Ogden (4,301 feet) over two summits of 8,247 and 7,395 feet respectively (sinking to 6,007 feet between) at 29 miles per hour inclusive, and 31¼ exclusive of stops. Against this creditable performance, which on the Continent of Europe would deserve a laurel crown, we have to put the boast of the advertisement of the Chicago and Alton line, 'the fastest train run by any road between Chicago and the Missouri River in either

direction.' Now from Kansas City to Chicago, 488 miles, their speed is only 33⅔ including, 34⅔ excluding stops, and of this only 44 miles —Jacksonville to Mason City—is done at real express speed, viz. 42 miles per hour.

Another admirable run in the Western States is that of the Denver and Rio Grande, narrow gauge, through 771 miles of mountains and gorges at 23 miles per hour inclusive from Denver to Ogden; a better performance than the broad gauge Northern Pacific, which does the 1,699 miles from St. Paul to Wallula, allowing for two hours difference of time, at 26½ miles per hour. Any of these runs, however, seem to show the energy of these wild Western roads as compared to the slowness of Continental Europe. It will be seen that even this last train runs quicker by 1 mile per hour than the Berlin-London express given on page 128.

It may be of interest here to give the distance and time necessary for crossing from Atlantic to Pacific Coasts in the United States and Canada respectively, and the speed, allowing for difference of time. From the table on p. 84 it will be seen that the new Canadian Pacific, which has the great advantage of being in the same hands throughout, averages just over 21 miles per hour, a very creditable performance for so enormous a distance, and with no population west of Toronto to speak of, while the American line serves large towns throughout. The American run is spoilt by the extraordinary badness of the connections at Chicago (wait of 10½ hours) and Council Bluffs (3¾ hours). To a foreigner, moreover, there are some very inexplicable facts. Thus though the Chicago, Milwaukee and St. Paul is 3 miles shorter from Chicago to Council Bluffs, it seems to make no effort to compete for the traffic. The same is the case with the Chicago, Burlington and Quincy. But as all the through traffic is practically controlled by the monopoly of the Union Pacific, perhaps these roads may intend to get across the mountains by some independent route in future. Under any circumstances we are promised shortly by the Union Pacific a 'Golden Gate Special, which is to render travel between the Missouri River and San Francisco luxurious and salubrious' and 8 hours quicker than the above. (*Note.*—This is now, Jan. 1889, an accomplished fact—at any rate as far as the increased speed goes.)

As regards gradients, the Canadian Pacific has much the best of it, its two big summits being the Rockies at Mount Stephen 5,296 feet (an ascent of 4,700 feet in 1,400 miles) descending thence nearly 3,000 feet to mount to Rogers Pass, 4,506 feet on the Selkirk range, and after that descending steadily to the Pacific, while the Union and Central Pacific start with a climb up the Rockies from Omaha (965 feet) to Sherman 8,240 feet (7,300 feet in 550 miles), and go on to Aspen 7,835 feet, descending 4,000 feet only to

mount up again to the Humboldt Mountains 6,150 feet, then descending another 2,000 feet to mount again the Sierra Nevadas at 7,017 feet, dropping to ocean level in less than 100 miles. Considering the character of American traffic, viz. heavily loaded goods trains for long distances at moderate speeds, these better gradients of the Canadian Pacific must tell far more than in our impatient little island.

BEST EXPRESSES, ATLANTIC TO PACIFIC SEABOARD.

UNITED STATES.

Miles		Time		Hours
		H. M.		
	New York . .	Mon. 9 0 A.M.	} Pennsylvania[1]	} 25
912	Chicago . . .	Tues. 9 0 A.M.		
		Tues. 7 30 P.M.	} Chicago and North Western[2]	} 49
1,402	Council Bluffs . .	Wed. 8 15 A.M.		
		Wed. 12 1 noon	} Union Pacific.	89
2,436	Ogden . . .	Thur. 11 30 P.M.		
		Thur. 11 0 P.M.	} Central Pacific.	128
3,270	San Francisco . .	Sat. 12 45 noon		

Four hours difference in time E. and W., making actual time 127·75 hours. Average speed, including stops = 25·6 miles per hour.

[1] By N.Y.C., 960 m., 9.50 A.M. to 9.50 A.M.

[2] By Chic. & Rock Island, 9 m. further, 7.30 P.M. to 11.25 A.M.

CANADIAN PACIFIC.

Miles		Time	Hours
		H. M.	
	Quebec	Mon. 2 45 P.M.	
172	Montreal	Mon. 8 5 P.M.	
		8 20	
292	Ottawa	Mon. 11 55	
		Tues. 12 1 A.M.	
1,165	Port Arthur	Wed. 3 15 P.M.	48
		2 25	
1,727	Brandon	Thur. 4 10 P.M.	74
		3 20	
2,255	Medicine Hat	Fri. 4 0 P.M.	98
2,653	Glacier House	Sat. 2 32 P.M.	123
3,078	Vancouver	Sun. 1 30 P.M.	146

Three hours difference in time E. and W., making actual time 145·75 hours. Average speed including stops = 21·1 miles per hour.

In the Southern States, as might be expected, speeds are very poor, with one or two exceptions, viz. the Atlantic Coast Line and a railway called the Central Railroad of South Carolina, which latter, if our figures are accurate, runs 40 miles from Sumter to Lane's with three stops in 56 minutes, about 43 inclusive or 47 exclusive

of stops. We end by the company next in our time-book, which probably may aspire to the proud position of the slowest in the civilised world (excluding, perhaps, Wurtemberg).

Scotland Neck Br. W. and W. Railroad.—Weldon to Scotland Neck—27 miles—in 3 hours 35 minutes, just 7 miles per hour.

General Figures of Express Mileage.

United States and Canada.

Miles	Between	No.	Speed incl. stops	Total exp. mileage
	Canada.			
	Grand Trunk.			
65	Chatham—London . .	1	41	65
64	Point Edward—London .	1	41	64
	Grand Total Canadian Rys.	2	41	129
	United States.			
	West Shore.			
51	Newark—Syracuse . .	2	41	102
	New York, Lake Erie and Western.			
53	Greycourt—Jersey City .	1	41	53
	Maine Central.			
139	Portland—Bangor . .	2	44	278
	New York and New England R.R.			
41	Boston—Valley Falls .	6	41	246
	Old Colony.			
44	Boston—Providence .	2	44	88
51	Do. —Fall River . .	2	41	102
	New York, Providence and Boston			
61	Providence—Groton .	1	41	61
	Boston and Albany.			
44	Boston—Worcester . .	2	42	88
54	Worcester—Springfield .	1	40	54
	New York Central and Hudson River R.			
143	New York—Albany .	2	42	286
147½	Albany—Syracuse . .	2	41½	295
150½	Syracuse—Buffalo . .	2	41½	301
45	Do. —Lyons . .	1	41	45
37½	Batavia—Buffalo . .	5	41	188
	Michigan Central.			
225	Niagara Falls—Windsor .	2	40	450
241	{Kensington (Chicago)—Ypsilanti . . .}	1	40	241

UNITED STATES AND CANADA—*continued.*

Miles	Between	No.	Speed incl. stops	Total exp. mileage
	Lake Shore and Michigan Southern.			
183	Buffalo – Cleveland . .	1	40⅔	183
88	Do. —Erie . . .	1	41	88
41	Erie—Ashtabula . .	2	40	82
133	Toledo—Elkhart . .	1	40	133
42	Elkhart—Laporte . .	1	41	42
	C.C.C. and I.			
75½	Cleveland—Crestline .	2	40	151
79	Do. --Gallon . .	1	40	79
	New York, New Haven and Hartford.			
136	New York—Springfield .	2	40	272
51	New Haven—New London	1	41	51
	Long Island.			
44½	Patchogue—Jamaica .	2	41	89
	Central of New Jersey.			
35½	Somerville—Jersey City .	1	41	35½
	New York and Long Branch.			
47	Long Branch—Jersey City	4	41	188
	New York and Philadelphia (C.N.J. & P. & R.)			
89½	New York—Philadelphia	14	41½	1,248
	Philadelphia and Reading.			
56	Camden—Atlantic City .	1	40	56
	Lehigh Valley.			
80	Jersey City—Easton .	4	40	320
	Pennsylvania.			
89¾	Jersey City—Philadelphia	26	42	2,334
81	Phil. (Camden)—Cape May	4	42	324
64	Do. —Atlantic City . .	11	42	704
59	Do. *viâ* Egg Harbour. .	14	42	826
48	Jersey City—Long Branch.	2	42	96
131	Crestline—Fort Wayne .	3	41½	393
132	Harrisburg—Altoona . .	2	41	264
42	Baltimore—Washington .	6	41	252
96	Phil.—Baltimore . .	8	40½	768
105	Do.—Harrisburg . .	2	40	210
		78	41⅗	6,171
	Vandalia.			
164	East St. Louis—Terre Haute	1	40	164
	Baltimore and Ohio.			
83	Baltimore—Washington Jc.	4	40	332
40	Do. —Washington .	12	43	480
	Cincinnati, Hamilton and Dayton.			
60	C.S.&C. Jc.—Dayton . .	2	40	120.
	Union Pacific.			
121	Brighton—Sterling . .	1	40	121

Miles	Between	No.	Speed incl. stops	Total exp. mileage
	Chicago, Burlington and Quincy.			
80	Camp Point—Galesburg .	1	40	80
54	Oxford—McCook . . .	1	40	54
	Chicago and Alton.			
44	Jacksonville—Mason City .	1	42	44
	Louisville and Nashville.			
45	Gallatin—Bowling Green .	1	40	45
39	Enfield—Mt. Vernon . .	2	41	78
	Cincinnati, New Orleans and Texas Pacific.			
40	Somerset—Junction City .	1	40	40
80	Boyce—Oakdale . . .	1	40	80
	Atlantic Coast Line.			
53	Weldon—Wilson . . .	1	41	41
	South Carolina Central.			
40	Sumter—Lane's . . .	2	43	80
	South Carolina R.			
130	Charleston—Columbia .	1	40	130
	GRAND TOTAL UNITED STATES . .		$41\frac{2}{5}$	13,956

SOUTH AMERICA.

THERE is, naturally, no book corresponding to 'Bradshaw' for the whole of South America, and it is therefore almost impossible to give accurate figures. The kindness of the secretaries of various companies, and of other friends, has however furnished us with time-tables of most of the railways, and as we have been carefully through the figures, we think it safe to say that there are no trains 'express' (Continental standard, viz. 29 m. p. h. incl. stops) except the following:—

ARGENTINE REPUBLIC.

THE best express is technically not 'express,' a train run by the Buenos Ayres and Rosario line.

Kils.	Miles		Time	Speed
			P.M.	
		Buenos Ayres . . .	12 25	
17·7	11	S. Martin	12 51	26
			54	
81·3	50	Campana	2 16	28½
			22	
93·3	58	Zarate	2 38	30
			40	
147·4	91	Baradero	3 47	29½
			53	
171·8	107	San Pedro	4 24	31
			25	
215·7	134	Ramallo	5 15	32
			16	
239·2	148½	St. Nicolas	5 45	30
			6 10	
305·7	190	Rosario	7 38	28

Including stops = 26. Excluding stops = 29.

The only other express mileage is run by the Provincial Railways. From Once to Mercedes 98 kils.=61 miles, 2 trains average incl. 30½, excl. 31, and from Pergamino to San Nicolas 79 kils.= 49 miles, 2 trains average incl. 29, excl. 31.

Thus the total exp. mileage would be about 220 miles. Fares about 2*d.* first and 1*d.* third per mile respectively.

No other trains are worth mentioning at present (although there

will probably be great improvements in the next few years) except the following :—

Buenos Ayres to La Plata.

From Central Station, viâ Pereyra, 36 m.; 1 hr. 15 min. = 28·8 m. per. hr.
„ Constitucion „ „ Temperley 37½ m.; 1 hr. 22 min. = 27·45 m. „ „

The first route being a combination of the Ensenada Company with the State line.

The second route a combination between the Great Southern and the State line.

Santa Fé to Galvez and Rosario.

Roughly scaled from Map. Galvez to Rosario, 68 miles in 2 hours 20 min.; (say 29 miles an hour).

CHILI.

THERE seem to be much better trains here, on the State line. From Talca to Santiago is about 150 miles, and is done in 4¾ hours, or just 31½ miles per hour inclusive (3 times a week). It is strange that Chili should have a faster train than any in Portugal or Spain.

According to the 'Railroad Gazette,' the distance from Concepcion to Santiago is 717 kils., done in 10 hours 50 mins., but this can hardly be correct, as it gives a speed of 41 miles per hour including stops, of which there are 15.

BRAZIL AND PERU.

WE have not had very accurate figures to work with, but we believe that no trains attain 29 miles per hour inclusive in either country : so that here at least Mr. Ruskin or Ouida might live a contented life.

INDIA AND THE AUSTRALIAN COLONIES.

AUGUST 1888.

INDIA.

No trains in India attain our Continental 'express' standard for any considerable distance.[1] The best service is from Bombay to Calcutta, 1,408 miles in 59¼ hours.

Speed including stops = 23⅗. Speed excluding stops = 26.

This is performed from Bombay to Jubbulpore (615 miles) by the Great Indian Peninsula Railway, on which the speed including stops is 22½—from Jubbulpore to Calcutta (793 miles) by the East Indian, inclusive speed 23⅗. The G.I.P. Railway has to cross the Ghâts, 2,000 feet, 4½ miles of 1/37, the rest 1/50, only 58 chains of the total hill section (9¼ miles) is level. The East Indian crosses hills on the Chord line, and again the Ghâts, near Markoondee. The results are poor compared with the Union Pacific of America. (See p. 82.)

Thus trains in India hardly ever appear to be booked above 30 miles an hour, and indeed this speed only occurs on the two above mentioned railways, and on one other, the Bombay, Baroda and Central India, which runs the 310 miles, Bombay to Allahabad, at a speed including stops of 23⅗, excluding stops 28. There is here some competition with the G.I.P. Railway for long distance traffic. There are also a few fast trains 26–30 miles an hour round Bombay and Calcutta, but the rest of the Indian service is deplorably slow. For instance, the mail from Delhi to Lahore, run by the extensive North-Western Railway, is 17¼ miles including, and 21 excluding stops.

The fastest runs appear to be:—*East Indian*, Rájbandh to Burdwan, 35 miles in 1 hour 2 minutes; *Great Indian Peninsula*, Karjat to Kalyan (with one stop), 28½ miles in 57 minutes.

Considering the flat country, considerable quantity of double line, long distances, large towns, and skilled engineers which we find in India, the results are very poor, and it is difficult to see why the trains in Australia should be so much better.

[1] Since this was written it is reported that the acceleration of the mail 'express' between Calcutta and Bombay has been 'homologated' by the Government. Is this a result of Sir Edward Watkin's visit?

AUSTRALIAN COLONIES.

In South Australia, Victoria, and New South Wales the speeds are most creditable, often amounting to over 40 miles an hour on single line, while the gradients are considerable, as will be seen below. We give the timing of the Intercolonial Mail, which is the best express in the Colonies. In certain cases the return train is slightly faster, but not above a mile an hour.

From Adelaide, 100 feet, the railway rises to 398 feet at Serviceton, the Victoria frontier, and then rapidly to 1,415 feet at Ballarat the Victorian summit; falling to 32 feet at Melbourne. Thence it rises to 531 feet at Albury, the New South Wales frontier, and goes on steadily ascending to Mittagong, 2,069 feet, the summit, whence it drops rapidly 2,000 feet in 77 miles to Sydney. North of Sydney again there are constant hills. From practically sea-level at the Hawkesbury River, it ascends steadily to a summit of 3,518 feet at Glen Innes, sinks to 1,500 at Wallangarra, the Queensland frontier, thence continuously to 58 feet at Brisbane.

Adelaide to Melbourne.

South Australia.

Gauge 5 ft. 3 in. Fare:—1st, 2*d.* per mile, 2nd, 1¼*d.* 1st & 2nd class.

Miles		Time	Speed
		P.M.	
	Adelaide .	3 30	
23½	Aldgate . .	4 29	23½
		32	
31¼	Mt. Barker Jc.	4 58	19
		5 0	
60¼	Murray Bridge	6 5	27
		30	
75¼	Tailem Bend .	6 55	35
		57	
114¼	Coonalbyn .	7 54	41
		57	
	Wirrega . .	8 26	39
		30	
183	Bordertown .	9 43	
		46	
196	Serviceton .	10 9	34

Including stops = 29⅖.
Excluding stops = 32⅔.

Victoria. (Same train continued.)

Gauge 5 ft. 3 in. Fare:—1st, 2*d.* per mile, 2nd, 1·3*d.*

Miles		Time	Speed
		P.M.	
196	Serviceton .	10 45	
234½	Nhill . .	11 55	33
		12 0	
242¾	Kiata . .	12 20	24
		23	
258	Dimboola .	12 55	28
		1 0	
279¼	Horsham .	1 45	28
		50	
297	Murtoa . .	2 21	34
		23	
332¾	Stawell . .	3 30	31
		35	
351½	Ararat . .	4 10	32
		13	
380	Beaufort . .	5 11	29
		16	
408½	Ballarat . .	6 13	30
		25	
463¾	Geelong . .	7 50	39
		8 20	
508¾	Melbourne .	9 45	32

Incl. stops = 28½. Excl. stops = 32.

Whole journey, Adelaide to Melbourne, allowing for difference of time, incl. stops 29, excl. stops 32.

Melbourne to Sydney.

Victoria.

1st & 2nd class.

Miles		Time	Speed
		P.M.	
	Melbourne .	4 55	
61¼	Seymour .	6 37	36
		57	
93¾	Euroa . .	7 46	40
		49	
121¼	Benalla . .	8 35	36
		40	
145½	Wangaratta .	9 20	36
		21	
159½	Springs . .	9 43	38
		46	
187	Wodonga .	10 28	39
		38	
190½	Albury . .	10 48	21

Including stops = 33.
Excluding stops = 37.

New South Wales. (Same train cont.)

Gauge 4 ft. 8½ in.

Fares:—1st, 2*d.* per mile; 2nd, 1·3*d.*

First class only.

Miles		Time	Speed
		P.M.	
	Albury . .	11 42	
267½	Wagga Wagga	1 34	41
		38	
289½	Junee . .	2 23	29
		30	
323½	Cootamundra .	3 40	29
		41	
348½	Harden . .	4 25	34
		30	
389½	Yass . .	5 55	29
		6 0	
442½	Goulburn .	7 35	33½
		8 0	
499½	Mittagong .	9 33	37
		40	
563½	Granville .	11 36	33
		40	
576½	Sydney . .	12 5	31

Incl. stops = 31. Excl. stops = 34.

Whole journey, Melbourne to Sydney, allowing for difference of time, incl. stops 31, excl. stops 35.

Sydney to Brisbane.

New South Wales.

Miles		Time	
		P.M.	
	Sydney . .	4 45	
490	Wallangarra .	5 0	

Including stops = 20¼.
Excluding stops = 24.

Queensland. (Same train cont.)

Gauge 3ft. 6in.

Fares:—1st, 2·15*d.*; 2nd, 1½*d.*

1st & 2nd.

Miles		Time	
		P.M.	
	Wallangarra .	5 30	
723	Brisbane .	6 15	
		A.M.	

Incl. stops = 18⅓. Excl. stops = 23.

Whole journey, Sydney to Brisbane, incl. stops 19¼, excl. stops 23½.

In Tasmania, West Australia, and New Zealand, there are no expresses. The best in New Zealand is a so-called express (narrow gauge, 3 ft. 6 in.) from Christchurch to Dunedin, 230 miles in 11½ hours, exactly 20 miles per hour including, and about 23 excluding stops.

At the Cape the best trains, from Capetown to Port Elizabeth, 839½ miles, Capetown to Kimberley, 647 miles, and Port Elizabeth to Kimberley, 485 miles, run only once weekly, and average about 22 including, 24 excluding stops. Fares 3*d.*, 2*d.*, and 1*d.* per mile in the three classes on the Government Railways.

EUROPEAN EXPRESS TRAINS.[1]

(*a.*) Countries. (*b.*) Administrations.

(1.) Each country takes its place in the ratio of its express miles to its population.

(2.) Each administration takes its place according to its average running speed, excluding stops.

THE accepted definition of an English express train is 'a train whose journey-speed is at least forty miles an hour.' 'Journey-speed' is defined to mean 'the average number of miles per hour, *stoppages included*, by which a train advances on its journey.' This figure shows generally the relative efficiency and energy of the traffic administration, while the other figure to be taken, the 'Running Average' or speed of the train while actually in motion (*i.e.*, *stoppages excluded*) shows roughly the relative efficiency of the Locomotive Department. As however, very few Continental express trains attain a journey-speed of forty miles an hour, it has been thought sufficient to allow any train attaining forty-six kilometres, or twenty-nine miles (including stops) to come in the category of express: this speed having been found to be that most usual in trains which are considered 'express' abroad. On the whole the speed of a train *with stops included* is the most important matter to decide, since this figure shows how quickly a train gets from one point to another over long distances, and the traveller naturally wishes to know this rather than the intermediate rate of speed, which may be very high, although the length of time wasted in stoppages makes the whole journey long and slow.

A stranger might expect that where the trunk lines are so much longer and the express routes less troubled with gradients than in England, an average speed would be achieved higher than in our small and hilly island. This is not the case. Were we, in compiling a list of Continental expresses, to adhere to the English definition of 'forty miles an hour, stops included,' we should not collect from the whole of Europe as much 'express' mileage as is run by our small Great Northern line. Lowering the standard to 29 m. p. h., we find that Europe has a daily express mileage of about 118,000, as against some 63,000 real 'express' miles daily run in England. In our country ridiculous results would follow if a foreigner went round dispensing honours for speed along our lines: modest 'stopping'

[1] For assistance in checking the figures for Europe we are much indebted to the editor of the *Continental Bradshaw*.

trains on the Great Northern or North-Western would be unable to escape; much as we might wish to spare their blushes, they would have to submit and be called 'express.' They might, indeed, while admitting the attainment of the required speed, yet point to their third class carriages in the hope of putting him off the scent. For in Europe no properly conducted express carries third class people; there are many exceptions, chiefly in Germany; but as a rule when we read 'express' at the head of a time-bill we are not disappointed in the associated legend 'first and second' or even 'first' only. Remembering this, we proceed to offer specimens of the choicest speed abroad, to be enjoyed as a rule only under expensive conditions.

It has often been extremely difficult to know what was an 'express.' For instance, a train from Paris to Reims may be express to Epernay and only fast beyond, and if it is really run for the sake of Reims, it would seem hardly fair to call it an express to Epernay.

But great indulgence has been shown where possible in admitting trains as expresses.

In so large a mass of details, we fear that some errors may have crept in, but we hope that they are not enough to alter the value of the general averages.

For those who care to understand the general position of European railroad policy, we would recommend the excellent Summary given by Mr. Hadley in his work on 'Railroad Transportation' (Putnam's).

The following table, viz. express mileage run in proportion to the population in each country, is given in order to obtain some sort of comparison between the relative 'express' efficiency of the railroads of different countries, and especially between Government and private railways, and exhibits the general results in a tabulated form. It will be observed that of the larger countries of Western Europe, France exhibits the worst results in the matter of cheap fast travelling, especially when the high fare per mile is considered, while England and Holland show much the best results. Again, it should be noted that in Switzerland, a country of private companies, though there are apparently no third class express trains, the second class fare is almost as low as the third class in France.

Of course the fares per mile in pence can only be considered as approximate, as the questions of free luggage, reduction on return and circular tickets, accommodation in carriages, etc., cannot be taken into account.

Great Britain and Holland have, however, the most comfortable third class carriages, and England allows most free weight of luggage.

The details of individual sections are in the Appendix.

Countries of Europe arranged in ratio of express miles per day to population.

Express fares in pence per mile approximately.			Country	Population, taken from Whitaker's Almanac, 1888.	Express mileage			Average speed		1 exp. mile per diem to following no. of inhabitants.
					Third Class	Per cent. of 3rd cl. to total	Total	incl. stops	excl. stops	
1	2	3								
2·00	1·25	0·95	Great Britain (at 40 miles per hr.)	32,700,000	57,207	93	62,574	41⅔	44⅗	525
1·60	1·30	0·80	Holland (at 29 miles per hr.)	4,390,000	6,475	81	8,000	32½	35	540
1·48	1·09	0·73	Belgium	5,910,000	4,133	59	6,919	31⅞	33½	850
1·91	1·43	1·05	France	38,000,000	11,263	27	41,130	32⅘	36¼	920
1·70	1·31	0·94	North Germany	32,180,000	18,6 7	72	25,798	31¾	34⅓	1,250
1·66	1·18	0·85	Switzerland	2,906,000	157	7	2,285	24⅖	26	1,270
1·70	1·31	0·94	South Germany	11,713,000	2,567	28	9,085	31⅕	33	1,290
2·30	1·75	0·95	Ireland	4,800,000	1,646	58	2,818	33	35	1,700
1·50	1·07	0·69	Denmark	2,030,000	845	100	845	30	32	2,400
1·80	1·33	0·90	Austro-Hungary	39,000,000	6,297	46	13,832	30	32	2,820
2·23	1·66	0·95	Roumania	5,000,000	—	—	1,207	29¼	32	4,500
2·00	1·33	0·85	Italy	30,000,000	1,213	26	4,705	29½	31¼	6,400
1·80	1·30	0·90	Sweden	4,644,000	—	—	632	29	31½	7,350
1·85	1·23	0·74	Egypt	6,000,000	—	—	520	36	37	11,500
2·37	1·72	0·81	Russia (European)	85,000,000	—	—	3,060	29	31⅜	27,700

No express, *i.e.* trains whose speed, including stops, is 29 miles an hour or over, in Algeria, Asia Minor, Bulgaria, Greece, Montenegro, Norway, Portugal, Servia, Spain, Tunis, or Turkey.

Normal gauge 4 ft. 8½ in. to 4 ft. 8⅝ in. in all the above countries except Ireland, 5 ft. 3 in.; Spain and Portugal, 5 ft. 6⅛ in.; Russia, 5 ft. (except Berlin to Warsaw, 4 ft. 8½ in.), and part of Great Western in England, 7 ft.

The preceding table should be taken in connection with the following percentage of line in each country with gradients *worse* than 1 in 200, as any gradient steeper than 1 in 200 greatly affects speed.

Switzerland	49	Roumania	26
France	38	Germany	24
Russia	35	Denmark	21
Italy	32	Belgium	20
Austria	27	Holland	10

Before coming to the individual countries, we give two tables which are of special interest to Englishmen. The first shows the number of hours which would be saved over the quickest existing service between London and the principal capitals of Europe, *vid* Calais, if trains abroad went at a speed of 40 miles an hour in cluding stops.

Berlin . . .	8 hours	Madrid . . .	6 hours
Berne . . .	7 „	Rome . . .	11 „
Brussels . . .	2 „	Vienna . . .	10 „
Lisbon . . .	13 „		

Next we give the Indian Mail, leaving London every Friday evening, Calais every Saturday morning.

INDIAN MAIL.

(London to Brindisi once weekly.)

Miles			Time	Actual speed including stops
75	London . .	L.C.D. & S.E. .	8 10 P.M. 9 57 „	43
100	Dover . . . Calais . . .		10 0 „ 11 45 „	15
290	Villeneuve (Paris)	Nord . . .	1 26 A.M. 6 45 „	30½
717	Modane . .	P.L.M. . .	7 3 „ 8 21 P.M.	32
891	Piacenza . .	Mediterranéo .	9 33 „ 5 18 A.M.	22½
1,455	Brindisi . .	Adriatico . .	5 28 „ 1 5 A.M.	30½

Total time, 52 hours. Average speed, including stops, 26 miles.

We may here observe that the Indian Mail, for which the English Post Office pays an enormous subsidy, goes, though a light train, considerably slower over the Nord and P.L.M. Companies of France and the Mediterranéo of Italy, than their ordinary expresses competing with the St. Gothard route. If it went at 40 miles per hour including stops from Calais, surely not an unreasonable speed to ask for such a train, it would reach Brindisi 13 hours sooner.

At present the 'Umbria,' 'Etruria,' and 'Empress,' go as fast on the sea as this International Mail train does on land, and any mail contract ought to stipulate a speed from the foreign companies at least equal to their best ordinary daily express over the same ground now that alternative competing routes are open, and the French companies no longer have the monopoly which they once possessed. The other expresses, running over this identical course abroad daily, exceed the average speed of this train by three miles an hour. (See pp. 108, 113.)

HOLLAND AND BELGIUM.

General Figures of Express Mileage.

Companies arranged in order of best average speed, excluding stops.

	Speed		Express mileage		
	incl.	excl.	Third class	Per cent. of third class to total	Total
Dutch Rhenish . .	34⅓	36	2,196	100	2,196
N. Brabant . . .	32½	35½	65	51	126
State Co.	32	34⅘	1,800	60	2,996
Central Dutch . . .	32⅖	34⅖	221	100	221
Holland Co. . . .	31⅗	34⅛	2,193	89	2,461
Dutch Railways (Total) .	32½	35	6,475	81	8,000
Belgian State Railways .	31¾	33½	4,133	59	6,919

The Low Countries, from their generally level surface, proximity to England, and advantageous position for forwarding European 'through' traffic, might be expected to develop much excellence in railway speed. And we have seen in the first table that they give the largest express service in proportion to population in Continental Europe. Being small nations, they have no need to be ashamed as long as they maintain a standard equal to that of their powerful neighbours France and Germany. In one respect their standard is higher, for while in France only 27 per cent. of the express mileage is third class, and 28 per cent. in S. Germany, in Belgium the percentage is 59, while in Holland it amounts to 81. The Belgian express fares are among the lowest in Europe, averaging 1·48*d.* a mile first class, 1·09*d.* second, and ·73*d.* third.

The Dutch railway service is much superior to the Belgian. Belgium is by situation the railway thoroughfare for Europe, and this peculiar 'sandwich' position should stimulate its railway executive (the State) to brilliant work. Holland, on the other hand, is remote from the main streams of international traffic. It has a population much smaller and more sparsely diffused. Yet the 'express' mileage of Holland is 15 per cent. greater than Belgium absolutely, and in proportion to population 63 per cent. better. Not only so, but the average Dutch speed exceeds the average Belgian by 1½ mile an hour. This is the more unexpected because, apart from railways, Holland has unique facilities for locomotion in its numerous steam-trams and its numberless canals. The frequent steam-boats which thus pervade one half the area of Holland replace, though at a higher speed, the carts and vans of an ordinary country; but in the extraordinary development of the Dutch steam-tram we

have a second system of communication, in many ways more convenient than the train. These trams run between all the towns worth mentioning, and make a speed of 15 to 20 miles an hour when under way, though of course they stop whenever required. To Scheveningen, with its thousands of summer visitors, they are the only railed transport. Some of these steam-trams do not hesitate at long journeys; thus between *Arnheim* and *Zeist*, a distance of 27 miles, there are five runs each way per day, besides six more each way which do half the distance.

It is true that Holland is dead level, while only part of Belgium is so. Against this, however, may be set two considerations; first, that the average length of 'express' runs in Holland is only 39 miles, compared with 48 miles in Belgium, and the shorter journey makes it the more difficult to attain a high average speed; secondly, as mentioned above, the Dutch railways give their people 40 per cent. more *third class* express than the Belgian, and this means heavier trains. Different principles of railroad working, however, obtain in the two countries. In Holland the railways are all worked by private enterprise, while in Belgium there is practically a complete State monopoly. The speed of the ordinary trains in Belgium, *i.e.* of all besides those averaged in the Appendix, is deplorably poor, often not exceeding 12–15 miles per hour stops included.

The management displays a brisker air in Holland. The engines are finer, mostly by English makers. Passengers and their luggage are tackled more rapidly, and there is less tendency to official hysterics when emergencies disturb the prescribed routine. In Holland the stations are 'open' as in England, the refreshment-rooms are both frequent and good, and comfort is everywhere more prominent than red tape. In small items of fittings of carriages, &c., Dutch thoroughness comes out. Thus the noiselessness of their windows, and the very neat arrangement for 'dowsing' the light during sleep, are two instances of detail which we in England are at present far behind. The little 'cross-country' service from Amsterdam to Leeuwarden, including a passage of 12 miles over the Zuider Zee, is worked as admirably as if it were a Continental service at 'express' fares. The boat has electric lights throughout, with a mere handful of passengers to appreciate them. In these matters the Dutch are large and easy-going, but they are also smart. The new Central station at Amsterdam is perhaps the finest in the world, and has the advantage of an unequalled site.

No doubt the excessive development in Holland of the steam-tram accounts for its very small proportion of *stopping*-trains to 'express,' as compared with Belgium. In the latter country only about a quarter of the total number of trains are 'express,' while in Holland there are more 'express' than stopping-trains. Indeed, on

the Dutch-Rhenish line between Rotterdam and Amsterdam, out of a total service (both ways) of 20 trains per day, 16 are 'express' and only 4 slow. Between the same two towns by the 'Holland' route there are 19 'express' and 10 slow. This gives a total of 35 expresses between Rotterdam and Amsterdam, as against 27 between

BEST EXPRESSES OF EACH COMPANY.

Kils.	Miles		Time	Speed
		N. Brabant.		
		1st and 2nd class.	P.M.	
		Goch	6 21	
61	38	Boxtel	7 28	34
		Holland Co.		
		1st, 2nd, and 3rd class.	A.M.	
		Rotterdam	9 0	
85½	53½	Amsterdam	10 10	46
Slows through 5 chief stations (including the Hague) to 10 miles an hour.				
		Central Dutch.		
		1st, 2nd, and 3rd class.	P.M.	
		Zwolle	7 4	
67	42	Amersfoort	8 18	34
			23	
88½	55	Utrecht	8 45	36
Including stops = 33. Excluding stops = 34½.				
		Dutch-Rhenish.		
		1st, 2nd, and 3rd class.	P.M.	
		Amsterdam	3 0	
19	12	Nieuwersluis	3 17	42⅓
			18	
73	45½	Rotterdam	4 10	38⅔
Including stops = 39. Excluding stops = 39½.				
		State Co.		
		1st and 2nd class.	P.M.	
		Rotterdam	5 28	
19¼	12¼	Dordrecht	5 50	33½
			53	
49¼	30½	Breda	6 26	33
			36	
87¼	54½	Boxtel	7 10	42⅓
			13	
159¼	99	Venlo	8 18	41
Including stops = 35. Excluding stops = 38½.				
		1st and 2nd class.	P.M.	
		Flushing	5 5	
99	61¾	Breda	6 33	42
			36	
137	85¼	Boxtel	7 10	41½
			13	
209	130	Venlo	8 18	41
Including stops = 40⅖. Excluding stops = 41⅔.				

Brussels and Antwerp. Again, between Haarlem and Amsterdam the 'Holland' company run 36 expresses. Taking steam-boats, steam-trams, and railways together, Holland reeks with locomotion, and it is difficult to realise, after witnessing such incessant variety of movement, that it is all maintained by and for a population less than London.

BEST BELGIAN EXPRESSES.

Kils.	Miles		Time	Speed
9.40 from London.				
		1st and 2nd class.	P.M.	
		Ostend	4 24	
23	14½	Bruges	4 45	41½
			47	
122	76	Brussels	6 19	40
		One stop outside Ghent.		
		Including stops = 39⅔. Excluding stops = 41.		
Calais and London.				
		1st, 2nd, and 3rd class.	P.M.	
		Tournai	3 25	
19	12	Leuze	3 44	38
			45	
31	19½	Ath	3 57	37½
			4 1	
83	52	Brussels (Midi) . . .	4 53	37½
		Including stops = 35½. Excluding stops = 37½.		
		1st and 2nd class.	P.M.	
		Arlon	3 56	
46	29	Libramont	4 45	35½
			46	
78	49	Jemelle	5 17	38¾
			21	
136	85	Namur	6 24	34¼
			28	
191	119	Brussels (Q. L.) . . .	7 26	35
		Including stops = 34. Excluding stops = 35½.		
From Cologne 1.13 P.M.			London 3.45 A.M.	
			P.M.	
		Verviers	3 30	
24	15	Liége	4 9	23
			13	
30	18¾	Ans	4 29	14
			30	
94	58¾	Louvain . . .	5 30	40
			34	
119	74¼	Malines	5 58	38¾
			6 2	
175	108¾	Gand	6 57	38
			7 0	
217	135	Bruges	7 41	38½
			44	
240	150	Ostend	8 8	37½
		Including stops = 32½. Excluding stops = 34⅘.		

FRANCE.

(Figures taken from the *Indicateur-Chaix*.)

In this country, the railroads belong to six great companies and a small State system (not 8 per cent. of the whole).

No competition for internal traffic is supposed to exist, and except at one or two points where the companies touch each other, it may be said that each company has the ground inside its concession to itself. There is, however, arising a very severe competition for long distance and international through traffic, a result which the originators of the French system did not foresee.

As the Government guarantee a minimum dividend to the companies (in some cases a very high one, *i.e.*, 13 per cent. in the case of the Nord, and 11 per cent. in that of the Paris-Lyon-Mediterranée), it has obviously every interest in maintaining monopoly.

In France no express fares exist except for 'Voitures de Luxe,' the extra fares for which are more than 6 times as high as in England, and 4 times as high as in Germany. Thus a berth in the sleeping car from London to Perth, 450 miles, costs 5*s*. above first class fare; from Paris to Avignon, 461 miles, from 36*s*. to 48*s*.

The companies are arranged in the order of average running speed (stops excluded).

On the whole, France has the best set of expresses on the Continent (excepting Holland), and it will be seen that their average speed is nearly two miles an hour quicker than in Germany. The best express in France is the bi-weekly 6.58 P.M. Paris to Bordeaux,

General Figures of Express Mileage.

Companies arranged in order of best average speed excluding stops.

Company	Speed		Express mileage		
	incl. stops	excl. stops	3rd class	Per cent. of 3rd class to total	Total
Est	34½	39	872	17	5,084
Nord	36	38	945	13	7,134
Orleans	33⅕	37⅕	5,389	62	8,641
Midi	31⅗	35⅗	122	4	3,308
P.L.M.	32	35½	1,778	22	8,084
Ouest	30½	33½	928	12	7,580
Etat	29⅓	32¼	1,299	100	1,299
Total	32⅘	36¼	11,263	27	41,130

first class only, at special express fares 50 per cent. above ordinary fares, and the best third class express is the 10.40 A.M. Paris to Angers. Both are run by the Orleans Company, but the Paris-Brussels and Paris-Calais expresses of the Nord Company have some slightly faster speeds between stations. (See pp. 108, 110).

EST.

THIS line has a curious mixture of good and bad features. It will be noticed that there are only six expresses which have third class attached, while at the same time there are some of the best first and second class expresses in France over difficult ground, and also some very good third class *fast* trains.

These are all the result of competition, and their history is a curious instance of the inability of any system to exclude it.

Originally all through traffic from London and Paris to Italy went *viâ* the P.L.M. Railway, and the Mont Cénis tunnel.

But with the completion of the St. Gothard tunnel, a new route was opened from London to Italy *viâ* Ostend, Brussels and Bâle, not touching France at all.

The Northern of France Company, therefore, who hold the key of the traffic from England at Calais, notwithstanding that it would have been more to their interest to continue to take Swiss traffic *viâ* Paris, yet, to prevent Belgian and German railways abstracting some of it *viâ* Ostend, were forced into creating a direct new service to Bâle *viâ* Laon in conjunction with the Est Company. The Est were naturally only too glad to co-operate, as they had hitherto obtained little or no through Swiss, and no Italian through traffic from England.

We thus get the Est running their best trains (Laon to Bâle) in competition with the German Alsace-Lorraine Railway. Similarly we get an express very nearly as good from Paris to Bâle, in competition really with the P.L.M. Company for Italian traffic from Paris, and good third class fast trains.

For though the two companies, Est and P.L.M., have entered into an agreement as to what parts of Switzerland each shall serve, there are still great efforts made by each to induce tourists to take their route, and for Milan and Italy there is actual competition.

It should be noticed that both these expresses are quicker than the much vaunted Orient express run by this company, by which train express fares are charged. Indeed, the ordinary morning train from Paris to Germany is quicker than the Orient express.

We may note that there are some very good *cross-country* fast trains third class run by the Est.

But there is still a vast amount of undeveloped resource. They do not give any express services from Paris to Belgium, Holland or North Germany, though their route is but little longer than the Nord, and to some places in the neighbourhood of Leipsic and Dresden their route *viâ* Metz is actually shorter, though the Nord takes all the traffic *viâ* Cologne—probably under agreement. The fact is that the existing French railroads are secure from competi-

BEST EXPRESS.

(From Paris, 1st class, also 2nd for through traffic).

Kils.	Miles		Time	Speed
		Paris	8 45 A.M.	
89	55¼	Longueville	10 7 „	40
			12 „	
167	103¾	Troyes	11 17 „	45
			42 „	
262	162½	Chaumont	1 10 P.M.	40
			15 „	
297	184½	Langres	1 44 „	45
			50 „	
381	236½	Vesoul	3 0 „	42
			5 „	
443	275	Belfort	4 3 „	40

Including stops = 38. Excluding stops = 42.

Note that the competitive Calais–Bâle express is actually slightly faster.

BEST EXPRESS TO GERMANY.

Kils.	Miles		Time	Speed
		Paris	9 45 A.M.	
66	42	La Ferté St. J. . . .	10 45 „	42
			46 „	
142	88¼	Epernay	11 50 „	43
			12 20 P.M.	
173	107½	Chalons	12 48 „	40
			54 „	
218	135¼	Blesme	1 35 „	40
			37 „	
254	157¾	Bar le Duc	2 10 „	40
			15 „	
320	198¾	Toul	3 17 „	40
			21 „	
345	214¼	Frouard	3 43 „	41
			45 „	
353	219¼	Nancy	3 55 „	30
			4 12 „	
376	233½	Blainville	4 33 „	40
			34 „	
386	239½	Lunéville	4 44 „	36
			47 „	
410	254½	Igney Avricourt . . .	5 12 „	36

Including stops = 34. Excluding stops = 40¾.

tion in their districts, and thus it is more to the interest of the existing corporations, knowing that they are perfectly secure, to make territorial agreements for division of traffic and to do a small business at high profits than to lay themselves out for a large business at small profits. But in this case it seems as if the Est must have made a bad bargain.

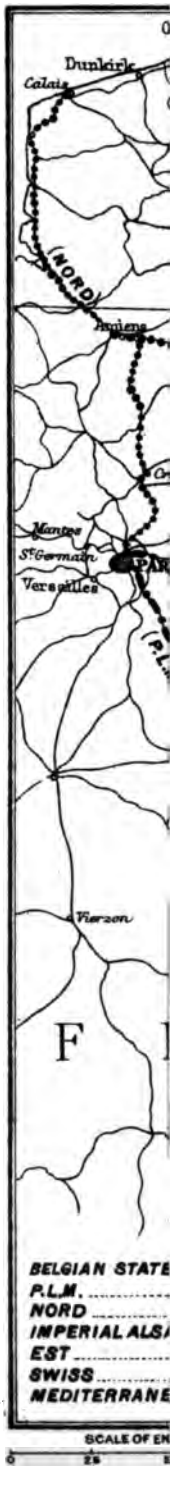
For instance, a passenger from Copenhagen, Cologne, or Berlin to the Riviera ought, geographically, to come over their system ; but under present arrangements it would take 24 hours longer than *viâ* Bâle or *viâ* Paris, and thus the traffic does not touch their system at all.

The table below shows what excellent results the French companies can give under pressure of competition.

LAON—BELFORT (CALAIS TO BÂLE).

Competitive with Ostend to Bâle, for which see p. 137.

Kils.	Miles		Time	Speed
			P.M.	
		Laon	8 5	
		Betheny	3 mins. stop	42
104	65	Chalons	9 41	
			46	
149	93	Blesme	10 24	44
			28	
239	149	Chaumont	11 52	40
			58	
358	222	Vesoul	1 40	43
			45	
419	260	Belfort	2 45	38
		mountains	2 55	
440	273	Delle	3 20	32
		To Belfort		42
	Including stops = 39		Excluding stops = 42.	
		Nord portion of the journey.		
		Calais (town)	3 18	
42	26½	Boulogne	4 0	39
			4	
120	75	Abbeville	5 11	43
			13	
165	103	Amiens	5 52	44
			57	
245	153	Tergnier	7 7	43
			32	
272	169	Laon	7 59	38
	Including stops = 36.		Excluding stops = 42.	
		Swiss portion of the journey.		
		Delle (with 4 stops)	3 55	
80	50	Bâle	6 15	22
	Including stops = 22.		Excluding stops = 25.	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(NORD)
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NORD.

THE best express to Calais, 11.15 A.M. from Paris, is a very creditable train, going, in fact, 1 mile an hour quicker than the trains in direct correspondence on the English side of the water, and so is the best Brussels express, and the timekeeping excellent. Moreover, the competition of the Dieppe route has introduced second class into all the Calais trains except the night mails,[1] though the speed of some of them might be improved, viz. the 12.27 noon Calais to Paris and Marseilles (the day mail from London) has a speed including stops of barely 35, while from London to Dover it is 45. If the French train ran at the same speed, it would reach Paris at 4.30 instead of 5.40 as at present. Considering, moreover, that the district served by the Nord is the richest industrial part of France, there are wonderfully few expresses, if we except the English services. For instance, there is none from Paris to Brussels between 8.15 A.M. and 3.50 P.M., and many important towns (*i.e.* Lille-Reims) have no expresses or even fast trains between them.

The great blot is the want of third class and even second class accommodation. Out of the 50 expresses from Paris for long distances only four are third class, and 12 are first class only for internal traffic. But remark, that where the expresses are to some extent competitative with the Est or Ouest they all contain the lower classes. It is not easy to see why the big towns stand this state of things. It may as well be brought out here that the ideal of French railway management seems to be a higher receipt per passenger train mile and a very low rate of working expenditure.

The error of this view has become evident in America and England. The average actual cost of running a locomotive and train does not exceed 1*s.* per mile at the utmost. It is therefore clear that 12 third class passengers at 1*d.* each per mile actually pay the cost of working a train, while any number over this is profit.

It will thus pay to run any train which averages a number over 12 passengers, provided they are not being taken out of some existing train. This is so important a point that we venture to elaborate it further. Supposing that the 11.15 A.M. from Paris to Calais earns a gross receipt of 9*s.* per train mile, it earns a net receipt of 8*s.* Now suppose another train put on at 2.0 P.M. which earns 6*s.* a mile only, and by doing so that the receipts in the 11.0 o'clock train are reduced to 6*s.* per train mile. Yet the two trains together now earn 12*s.* gross per mile, or 10*s.* net, and thus in

[1] From June 1, 1889, these trains are announced to carry second class passengers.

the aggregate are netting 2*s.* per mile more than when there was only one train.

It seems only probably that a considerable increase of cheap passenger trains on the French systems would stimulate travel and far more than cover the extra cost of working them.

It should be noticed that the run from Amiens to Calais Town, 101 miles, is the longest daily train without a stop on the continent of Europe, beating that from Laroche to Dijon (P.L.M. line, see p. 113) by about 2 miles. It is also performed at $2\frac{1}{4}$ miles per hour quicker speed. In England the run from London at 10.40 A.M. to Nottingham (Midland) is 23 miles further and performed 8 miles per hour quicker.

BEST EXPRESSES.

1st and 2nd class.

Kils.	Miles		Time	Speed
		Paris	11 15 A.M.	
131	82	Amiens	1 10 P.M.	43
			15 „	
294	183	Calais Town	3 32 „	$44\frac{1}{4}$

Including stops = 43. Excluding stops = 44.

BEST EXPRESS IN THE SERVICE WITH BELGIUM.

1st (and 2nd for through traffic).

Kils.	Miles		Time	Speed
		Feignies	2 54 P.M.	
15	$9\frac{1}{2}$	Aulnoye	3 10 „	36
			11 „	
77	48	St. Quentin	3 59 „	48
			4 0 „	
100	62	Tergnier	4 20 „	42
			24 „	
147	$91\frac{1}{2}$	Compiègne	5 4 „	46
			5 „	
180	112	Creil	5 35 „	42
			36 „	
231	144	Paris	6 25 „	40

Including stops = 41. Excluding stops = $42\frac{1}{2}$.

ORLEANS.

THIS company is, in every way, the most enterprising in France from a passenger and express point of view.

The reasons for this appear to lie in its geographical position, stretching one arm up almost to Brest and another to Toulouse, having

also to meet at almost every point the most severe competition in France, as will be seen by the sketch map.

Reasons for the Best Trains.

1. *To Bordeaux.*—The speed of the first class trains has always been good, the complicated reason for which seems to lie in the fact that the Midi system had two possible allies for traffic to Paris—the P.L.M. and the Orleans. Now the Midi, as will be seen from the map, controls all through traffic to Spain.

On the whole it was to the interest of the Midi to get traffic at Bordeaux from the Orleans, which gave them a longer mileage, rather than from the P.L.M. at Cette, by which route they obtained less mileage. So the Midi said to the Orleans: 'We will befriend you if you give us first rate services to Bordeaux.'

Thus the best service from Paris to Toulouse, *vid* Bordeaux, is actually one hour quicker than the direct route by the Orleans Company throughout, though the distance by Bordeaux is 57 miles longer, and to Barcelona from Paris the route, *vid* Bordeaux, is far quicker in duration of journey than the shorter mileage route of the P.L.M.

2. *Toulouse.*—The most profitable place for the Orleans to hand traffic for the south to the Midi would be Toulouse, and thus, of course, they run as it were in competition with their Bordeaux route extremely good trains to Toulouse, with even third class attached, over very difficult ground.

3. *Third class to Bordeaux.*—The opening of the State line to Bordeaux made them quicken up their third class expresses two hours, and so we now get a good third class service there. (See p. 116.)

4. *Watering places of the Puy.*—We shall see under the heading P.L.M. (p. 112), how these trains arose.

5. *Angers, Nantes, St. Nazaire, &c.*—The Ouest line was always a shorter route to these places, but arrangements had been made for pooling traffic between the Orleans and Ouest Companies. Now when the State line was opened, in addition to the other two routes to these places, of course the pool had to be revised, and it is a fact generally admitted that whereas pooling arrangements to exclude all competition are easy between two, they are very difficult between three companies going to the same place.

So, at any rate, while the present competition lasts, we see the Orleans two hours faster than they were, and admitting third class passengers in order to keep their share of the traffic, while the new arrangement is being made between the three railways for division of traffic.

BEST EXPRESS.

1st class only at express fares.

Luxe train to Bordeaux (St. Jean) twice weekly. The 11.15 A.M. Nord to Calais, and this train, are the fastest long distance expresses on the Continent.

Kils.	Miles		Time	Speed
		Paris	6 58 P.M.	
119	74	Les Aubrais	8 38 „	44½
			42 „	
231	143½	St. Pierre des Corps . .	10 13 „	45⅔
			17 „	
332	206	Poitiers	11 45 „	42⅔
			49 „	
445	276	Angoulême	1 24 A.M.	44¼
			28 „	
527	327	Coutras	2 37 „	43¾
			38 „	
585	364	Bordeaux (St. J.) . . .	3 30 „	44½

Including stops = 42⅔. Excluding stops = 44⅕.

This train is 18 minutes slower since Nov. 1, 1888.

To Angers.

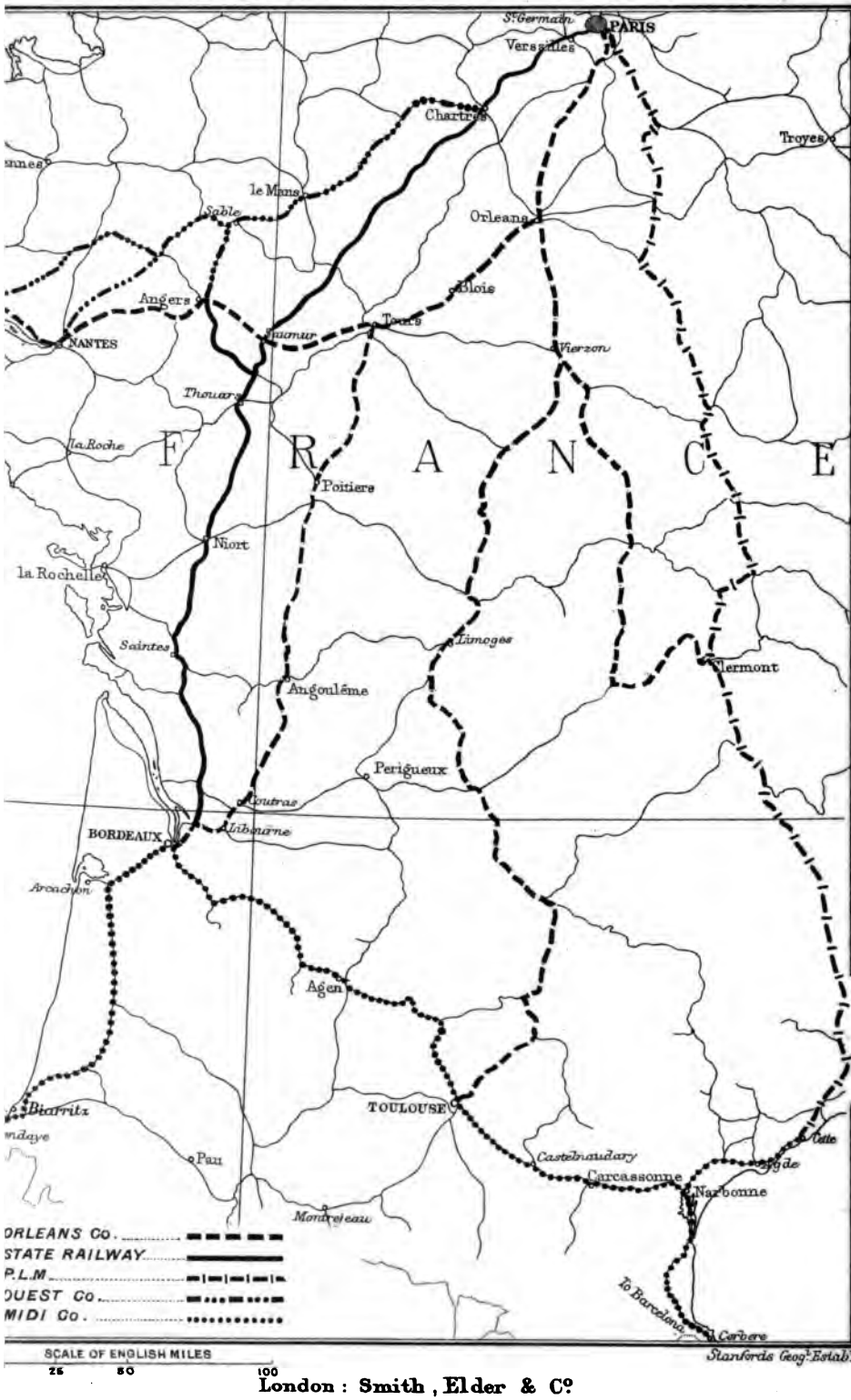
Competitive 1st, 2nd and 3rd class.

Kils.	Miles		Time	Speed
		Paris	10 40 A.M.	
56	34¾	Etampes	11 30 „	41
			32 „	
119	74	Les Aubrais	12 25 P.M.	44
			30 „	
147	91¼	Beaugency	12 54 „	42
			55 „	
178	110½	Blois	1 22 „	42
			25 „	
193	120	Onzain	1 38 „	42
			39 „	
211	131	Amboise	1 54 „	43
			56 „	
231	143½	St. Pierre	2 15 „	38
			24 „	
257	160	Langeais	2 48 „	42
			49 „	
278	172	Port Boulet	3 8 „	34
			9 „	
295	184	Saumur	3 24 „	44
			29 „	
311	193	Les Rosiers	3 44 „	40
			45 „	
316	196½	La Menitre	3 51 „	38
			52 „	
320	199	St. Mathurin	3 56 „	30
			58 „	
339	211	Angers	4 17 „	38

Including stops = 37½. Excluding stops = 42.

Though 3rd class, this train is 3 miles an hour faster in running speed than the P.L.M. special (1st class only) express fare train to Marseilles (see p. 113); clearly the result of competition.

COMPETITIVE RAILWAYS IN WESTERN FRANCE



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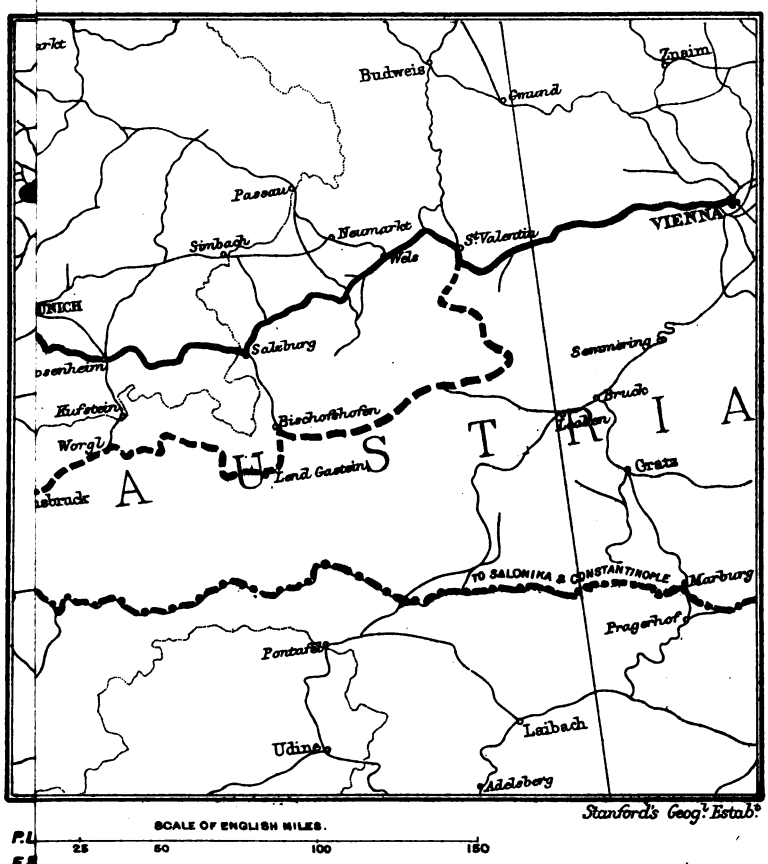


BEST EXPRESS.

6.55 P.M. Bordeaux to Narbonne, 406 kils. = 252 miles. First only.

Kils.	Miles		Time	Speed
		Bordeaux (St. Jean) . .	6 55 P.M.	
79	49	Marmande	8 1 „	44
			4 „	
136	85	Agen	8 52 „	44
			57 „	
206	128	Montauban . . .	9 58 „	43
			10 2 „	
257	160	Toulouse	10 50 „	41
			59 „	
312	194	Castelnaudary . . .	11 49 „	40
			51 „	
348	217	Carcassonne . . .	12 23 A.M.	43
			28 „	
406	252	Narbonne	1 19 „	42

Including stops = 39¼. Excluding stops = 42.

OUEST.

THIS company has very much improved of late years, though its speeds are not excessive.

Its line goes through very much difficult country, but its best trains are creditable, especially to Dieppe.

The competition of the Etat and Orleans has improved its speed in the southern sections.

There exists a curious arrangement by which some of the trains of the Orleans Company are run by the Ouest from Paris as far as Angers, though since the new State line opened and troubled the pool the Orleans have lately discovered that they can accomplish the journey as quickly as the Ouest, by their own line 20 miles further round, so that these trains of the Ouest, which used to be the best in N.W. France, have been eclipsed by others run by a competing company.

BEST EXPRESSES.

(1.) Called 'Rapide,' 1st only.

Kils.	Miles		Time	Speed
		Paris	12 45 P.M.	
80	50	Vernon	2 6 „	37
			10 „	
136	85	Rouen	3 11 „	35
			18 „	
161	100	Clères	3 42 „	40
			43 „	
201	125	Dieppe	4 27 „	33

Including stops = 34. Excluding stops = 36.

BEST EXPRESSES—*continued.*

(2.) 10.0 P.M. Paris to Angers, 1st and 2nd. Competitive with Orleans and Etat.

Kils.	Miles		Time	Speed
		Paris	10 0 P.M.	
27	17	Versailles	10 33 „	31
			34 „	
95	59	Chartres	11 45 „	36
			50 „	
156	97	Nogent	12 51 A.M.	39
			53 „	
218	136	Le Mans	1 53 „	38
			2 10 „	
266	166	Sablé	3 2 „	35
			6 „	
291	180	Etriche	3 30 „	34
			31 „	
309	192	Ecouflant	3 50 „	35
			52 „	
315	196	Angers	4 4 „	25

Including stops = 33. Excluding stops = 35½.

ÉTAT.

THE opening of the State lines into Bordeaux on the one hand, with running powers over the Ouest to Paris on the other, formed what had been a heterogeneous mass of unprofitable local lines into a new through route from Paris to Bordeaux, and has worked wonders in the way of improved third class fast trains in western France, although the exchange of lines made with the Orleans was intended to prevent competition.

The speed of the best trains is very creditable, considering that much of the line is single and the gradients very bad. *Every train is third class*, and the rolling stock is the best in France.

It is not clear why better arrangements are not made for through third class traffic with the Midi system, but we may hope for better things as soon as the State get their own line into Bordeaux instead of running powers merely over the Orleans from Coutras, about 40 miles outside Bordeaux.

A legal decision practically upholding equal mileage rates has prevented their having a free hand to compete with the Orleans or Ouest, as they are several miles longer. It may be added that these State lines are the fragment of a policy upheld by Gambetta with the intention of creating a far larger State system, but abandoned on his death owing to financial and other difficulties. (See 'Hadley's Railroad Transportation.')

The improvements which this new line has effected may be best seen by the following table of the fast trains between Paris and Bordeaux and Paris and Angers respectively, before and after the opening, which took place in July, 1886.

SERVICE IN MAY 1886 (practically the same as in 1877).

	1	1, 2, and 3	1		1, 2, and 3
Paris . .	8 45 A.M.	9 30 A.M.	8 20 P.M.		11 25 P.M.
Bordeaux . .	5 52 P.M.	10 34 P.M.	6 45 A.M.		1 47 „

MAY 1887.

	1	1, 2, and 3	1	1, 2, and 3	1, 2, and 3
Paris . .	*8 45 A.M.*	*10 40 A.M.*	*8 20 P.M.*	*9 40 P.M.*	*11 15 P.M.*
Bordeaux . .	*5 52 P.M.*	*10 14 P.M.*	*6 45 A.M.*	*9 35 A.M.*	*1 47 „*

MAY 1886.

	1	1, 2, and 3	1	1, 2, and 3	1 and 2
Bordeaux . .	6 45 P.M.	9 20 P.M	7 50 A.M.	8 0 A.M.	12 30 mid.
Paris . .	5 7 A.M.	11 0 A.M.	4 56 P.M.	9 4 P.M.	4 9 P.M.

MAY 1887.

	1	1, 2, and 3	1	1, 2, and 3	1, 2, and 3
Bordeaux . .	*6 45 P.M.*	*10 20 P.M.*	*7 50 A.M.*	*8 10 A.M.*	*12 30 mid.*
Paris . .	*5 7 A.M.*	*10 39 A.M.*	*4 58 P.M.*	*8 16 P.M.*	*3 6 P.M.*

1886.

	1 and 2	1		1 and 2	1	1 and 2
Paris .	9 10 A.M.	8 45 P.M.	Angers	8 45 A.M.	9 30 P.M.	2 19 A.M.
Angers	4 30 P.M.	3 58 A.M.	Paris .	4 9 P.M.	5 7 A.M.	11 0 „

1887.

	1, 2, and 3	1		1, 2, and 3	1	1, 2, and 3
Paris .	*10 40 A.M.*	*8 35 P.M.*	*Angers*	*8 45 A.M.*	*9 30 P.M.*	*2 19 A.M.*
Angers	*4 17 P.M.*	*3 57 A.M.*	*Paris .*	*3 6 P.M.*	*5 7 A.M.*	*10 39 „*

We see thus that in one year a new third class express has been given to Bordeaux from Paris, another night train has been made third class from Bordeaux, and the average journey-time of the other third class trains has been diminished by considerably more than an hour. The improvement to Angers is even more marked.

To Lyons and Marseilles, on the contrary, during the same period there have been no new facilities given, and the best express is 28 mins. slower (see p. 111). But then there has been no new competing line opened.

BEST EXPRESS.

7.25 A.M. Paris to Saintes (for Bordeaux), partly single line, bad gradients. 1st, 2nd, and 3rd class.

Kils.	Miles		Time	Speed
		Paris (Mont Parnasse) . .	7 25 A.M.	
17	10½	Versailles	7 49 „	28
			50 „	
69	43	Maintenon	8 40 „	38
			41 „	
88	55	Chartres	9 1 „	36
			6 „	
125	78	Brou	9 53 „	29
			54 „	
142	89	Courtalain	10 12 „	33
			37 „	
185	115	Bessé	11 20 „	37
			21 „	
193	120	Pont de Braye . . .	11 31 „	24
			35 „	
218	135½	Chateau du Loir . . .	12 5 P.M.	31
			9 „	
237	147½	Chateau la Vallier . .	12 33 „	30
			34 „	
254	158	Noyant	12 54 „	33
			55 „	
287	179	Saumur	1 33 „	32
			38 „	
308	191⅓	Montreuil	2 6 „	27
			8 „	
326	202½	Thouars	2 27 „	34
			34 „	
351	219	Airvault	3 0 „	37
			2 „	
371	230½	Parthenay	3 27 „	28
			28 „	
416	258½	Niort	4 17 „	34½
			27 „	
435	270	Beauvoir	4 48 „	28
			49 „	
445	277	Villeneuve	5 0 „	38
			1 „	
464	289	St. Jean d'Angely . .	5 23 „	33
			24 „	
483	300⅛	Taillebourg	5 50 „	28
			52 „	
493	306½	Saintes	6 3 „	33

Including stops = 29. Excluding stops = 33.

GERMANY.

PRUSSIAN STATE RAILWAYS.

THE railways of North Germany have now been almost all acquired by the State, and the preponderating influence of Prussia makes the railway policy of Berlin the guiding star of North German railway policy. Bismarck attempted to amalgamate the railways of Germany under one Imperial control, but failed; yet now Prussia controls the working and the receipts of all principal German roads except the following, which, however, are largely dependent for traffic on the encircling Prussian lines :—

Saxon State
Bavarian State
Baden State
Main Neckar
Wurtemberg State
Oldenburg State
Luxemburg
Palatinate
The Hesse Louis
Lübeck-Büchen
Mecklenburg Friedrich Franz
} The only great private corporations remaining.
Imperial Railways in Alsace-Lorraine.

As far as our subject—express trains—is concerned, the acquisition of the private companies by the State has had an exceedingly bad effect.

In former days there were two principal lines of important through traffic, viz., from east to west, and from north to south.

Berlin was joined to England and Belgium by two great companies, the Köln Minden and the Bergisch Markisch, and such good expresses as we have now are the result of their rivalry.

From Berlin to Franfort, again, there were three competing lines, and say about the year 1875 the service was the finest on the Continent, and quite equal to any in England.

But now in England our private companies have been steadily progressing in speed and cheap accommodation, whereas the German Government railways remain with the same speeds and with the same accommodation (as far as cheapness goes) as before.

And it is noteworthy that the old competing trains run over much the same ground, at the same hours as in old days, showing that the Government have not dared to take off (say between Berlin and Frankfort) the accommodation which was given by the competing expresses to the intermediate towns.

Again, a Government system has not really the interest which private companies have in developing new cross-country services. For instance, the traffic between London and Berlin, both by Calais and Flushing, is taken at least 20 miles out of the shortest route, because a great monopoly can afford to waste a longer time over the journey, in order not to have to spend money on building cross-country lines or improving junctions and services.

Political considerations also may tend to bad arrangements.

Thus between London and Berlin the services *viâ* Calais are simply an international disgrace (see p. 128), from the dislike of the Germans to send their mails through France (which they would be compelled to do by force of circumstances if this natural route were worked to full advantage), and from the Belgian Government owning competitive steamers from Ostend to which route they wish to attract the traffic. Yet the private English companies engaged in this service do their part well enough. This may be seen from the table on page 128.

The sudden closing of the Alsace-Lorraine frontier is another instance showing how Government railways can be used to help an intolerable system of Cæsarism. Had there been a dozen powerful railway companies taking traffic across the frontiers, instead of one Government monopoly, it would have been almost impossible for Prussia to have ruined all their passenger traffic at one blow. At any rate we should have heard much more about it. And now comes the news that shortly the Prussian Government will absolutely prohibit the working of any foreign through carriages over its lines. They have already treated the International Sleeping Car Company very badly, and have practically boycotted their through cars.

As we go on, taking the various 'directions' of the State railways in order, we shall find curious relics of the past, and be able to note better the details.

A word of praise should not be omitted to the compilers of the 'Reichskursbuch,' a sort of European Bradshaw, which surpasses in accuracy and ingenuity any similar publication in the world, and is at any rate one good result of the German centralisation.[1]

As trains in North Germany are run on a schedule of local time, and as it would have been extremely difficult to discover this exactly,

[1] Our own 'Continental Bradshaw' is now also very much improved (1889).

we have in the case of the 'best expresses' given the average of the two best trains in opposite directions, so that the error, if any, is very small.

The best express in North Germany is the 4.5 P.M., Hamburg to Berlin, 1st and 2nd class, see p. 122 (Altona Adm.). The best third class expresses, the Berlin-Eydtkuhnen (Bromberg Adm., p. 125), Berlin-Dresden and Berlin-Breslau (Berlin Adm., p. 124). Also Berlin-Röderau-Dresden (Erfurt Adm., p. 125).

NORTH GERMANY.

General Figures of Express Mileage.

Railways in North Germany, including Mecklenburg and Oldenburg, but excluding Alsace Lorraine, Saxony, Bavaria, Wurtemberg, Hesse, and the Palatinate.

Arranged in the order of best average speed excluding stops.

Prussian State Railways.

	Speed		Express mileage		
	incl. stops	excl. stops	3rd class	Per cent. of 3rd class to total	Total
Altona	34	36½	1,092	76	1,448
Magdeburg	33⅕	35⅖	3,024	82	3,660
Right Rhine	33	35⅓	750	84	891
Hanover	32½	35	3,119	60	5,163
Berlin	32	35	3,068	94	3,278
Erfurt	31⅕	33¾	1,826	60	3,095
Bromberg	30	32½	1,596	62	2,560
Breslau	29½	32½	814	100	814
Left Rhine	30⅖	32¾	432	26	1,645
Frankfort o/M	30½	32½	1,390	89	1,550
Elberfeld	30	32	489	76	647
Oldenburg State Railways.					
Oldenburg	30	32	121	100	121
Private Railways.					
Unter Elbesche	33	33⅓	252	100	252
Nord-Deutscher Lloyd	32	32	158	100	158
Lübeck Büchener	29¼	33	526	100	526
Mecklenburg Friedrich Franz	29	33	—	—	56
Grand total	31¾	34⅓	18,657	72	25,798

BEST EXPRESSES.

Berlin—Cologne. 1st and 2nd class only.

MAGDEBURG, HANOVER, AND RIGHT RHINE ADMINISTRATIONS.

Kils.	Miles		Time		Speed
			NOON	P.M.	
		Berlin (Z.G.)	12 6	10 30	20
2	1¾	Charlottenburg . . .	12 10	10 26	
			12 12	10 24	28
12½	8	Spandau	12 26	10 7	
			12 28	10 5	41½
105	65¼	Stendal	1 43	8 34	
			1 48	8 30	
167	103¾	Oebisfelde		7 34	44½
				7 32	
239	148¾	Lehrte (from here to Hamm Hanover Adm.) . .	3 32	6 28	
			3 33	6 27	35
255	158¼	Hanover	3 49	6 10	
			4 13	5 56	
276½	171¾	Wunstorf		5 53	40
				5 32	
319½	199	Minden	5 12	4 50 ↑	
			5 16	4 46	40
334½	208¼	Oeynhausen	5 31 ↓	4 33	
			5 32	4 32	33
340	211¼	Löhne	5 38	4 23	
			5 40	4 21	38
364¼	227	Bielefeld	6 5	3 59	
			6 7	3 57	39
431½	268¼	Hamm (from here to Cologne Right Rhine Adm.) .	7 2	2 55	
			7 7	2 50	40
462	287	Dortmund	7 33	2 20	
			7 35	2 17	40
511	317¼	Oberhausen	8 18	1 29	
			8 21	1 22	28
518½	322	Duisburg	8 30	1 10	
			8 31	1 9	38
543½	338	Düsseldorf	8 56	12 43	
			9 0	12 39	37
583	362½	Cologne	9 40	12 0	
			P.M.	NOON	

Including stops = 36. Excluding stops = 40.

These expresses, by far the most important in Germany, as they take mails and passengers between Berlin and London, Paris, Brussels, and Madrid, do not actually quite attain an average of 40 per hour excluding stops; the exact figure is 39·87. This is 4 miles an hour less than the best French train (Paris-Bordeaux, see p. 110), and 9 less than the 10.0 A.M. Euston to Edinburgh. The time on journey is 20 minutes longer than in 1879, when there was severe competition by the Bergisch-Markisch railway, *vid* Aix and Kreiensen. Had this continued to the present day, there is no doubt but that we should have seen a greater number of expresses; at present there are only 4 each way between such important

places as Berlin and Hanover,[1] whereas between Bristol and Manchester (20 miles further across country) there are 9.

The German administrators seem to hold the same view as the French, that reduction of expenditure is preferable to increase of traffic, *i.e.* that to do a small business at large profits (which is unquestionably less trouble to themselves) is also preferable financially. The fallacy of this is clear if we remember how little it costs merely to run a train over an existing line; probably 12 third-class passengers pay its working expenses.

Now the Government have no interest in encouraging fresh lines of travel; they force all traffic into this route through Cologne and Hanover, and have practically discontinued the international services *vid* Aix, Bleyberg, and Kreiensen, and, of course, have no interest in opening any new ways from Dresden, &c., to Western Europe by more southern routes, since all such traffic must *as it is* pass over their existing lines in existing trains.

It is to be noted that they actually join the Calais and Flushing expresses at Oberhausen, and do not give each a separate train to Berlin, and since the Flushing route is controlled by them, they have discontinued the through carriage which used to run from Calais to Berlin. In this administration (Magdeburg) there are some extremely good speeds from Wittenberg to Leipsic, a relic of the days when there was severe competition for traffic from North to South Germany, by the Magdeburg, Hanover, and Berlin routes. This, of course, has now ceased.

BEST EXPRESS.

ALTONA ADMINISTRATION.

Berlin—Hamburg. 1st and 2nd class.

Kils.	Miles		Time		Speed
			P.M.	P.M.	
		Berlin	5 15	9 7	
$11\frac{3}{4}$	$7\frac{1}{2}$	Spandau	5 29	8 51	30
			5 34	8 48	
$75\frac{1}{2}$	$47\frac{1}{4}$	Neustadt	6 28	7 49	$38\frac{1}{2}$
			6 29	7 48	
$126\frac{1}{2}$	$78\frac{3}{4}$	Wittenberge	7 8	6 58	41
			7 15	6 50	
171	$106\frac{1}{4}$	Ludwigslust	7 53	6 11 ↑	38
			7 54	6 10	
192	$119\frac{1}{4}$	Hagenow	8 12	5 50	41
			↓8 15	5 45	
239	$148\frac{3}{4}$	Büchen	8 53	5 3	44
			8 57	4 58	
$249\frac{1}{3}$	155	Schwarzenbek . . .	—	4 47	41
				4 46	
270	$167\frac{1}{2}$	Bergedorf	9 23	4 26	
			9 24	4 25	30
$285\frac{1}{2}$	$177\frac{1}{2}$	Hamburg	9 44	4 5	

Including stops = $37\frac{1}{3}$. Excluding stops = $40\frac{1}{3}$.

[1] Two are to be added in 1889.

This is a very fine train, the result of severe competition which used to exist, *viâ* Uelzen. When the Berlin-Hamburg Railway existed as a private company the train was even faster, but now the Government have no competition, except, perhaps, such as lies in the sea route for traffic between Berlin and Copenhagen, *viâ* Warnemunde, which gives them considerably less mileage than this route.

The Government paid for the acquisition of this line a price which gave to the stockholders of the original Berlin-Hamburg Company an income of 17 per cent. on their investment. It is a curious fact to come across in a country which seems tending to State socialism.

BEST EXPRESS.

RIGHT RHINE ADMINISTRATION.

Emden—Münster (summer only) 1st, 2nd and 3rd class.

Kils.	Miles		Time P.M.	Time A.M.	Speed
		Emden	2 47	6 10	} 36
25½	15¾	Leer	3 13	5 43	
			3 17	5 39	} 33
33	20½	Ihrhove	3 26	5 30	
			3 27	5 29	
42½	26¾	Papenburg	3 37	5 19↑	} 36
			3 38	5 18	
88½	55½	Meppen	↓4 23	4 36	} 39½
			4 24	4 35	
108¾	67	Lingen	4 44	4 16	} 37
			4 45	4 15	
139¾	86½	Rheine	5 13	3 46	} 39½
			5 14	3 45	
178½	111	Münster	5 52	3 10	} 37½

Including stops = 37. Excluding stops = 38.

A most creditable train.

It must be remembered that these services are to some extent competitive with the excellent trains of the adjacent Dutch railways, and there is considerable personal rivalry in such cases between the administrators who prepare the time bill, even if no direct competition exists.

It would hardly be creditable for a powerful Government Administration to find that its trains were five miles an hour slower than those of a private company close by, especially if the Government railway served more important towns.

BEST EXPRESSES.

BERLIN ADMINISTRATION.

Berlin—Breslau. 1st, 2nd, and 3rd class.

Kils.	Miles		Time A.M.	Time P.M.	Speed
		Berlin	8 50	4 59	
47	29¼	Fürstenwalde	9 39	4 16	39
			9 40	4 15	
81	50⅛	Frankfort	10 16	3 42	36
			10 24	3 30	
129	80	Guben	11 10	2 43	39½
			11 13	2 39	
156	97¾	Sommerfeld	11 41	2 14	38
			11 46	2 9	
183	114¼	Sorau	12 15	1 44	38
			12 17	1 39 ↑	
224	139	Kohlfurt	1 1	1 0	37
			1 31 ↓	12 40	
249	155	Bunzlau	1 57	12 18	37
			1 58	12 17	
276	171½	Haynau	—	11 57	
			—	11 52	39
295	183⅓	Liegnitz	2 43	11 33	
			2 48	11 25	38
326	202½	Neumarkt	3 19	10 54	
			3 20	10 53	37
355	221½	Mochbern	3 50	10 25	
			3 51	10 24	21
360	224½	Breslau	4 0	10 15	
			P.M.	A.M.	

Including stops = 32. Excluding stops = 37¼.

Berlin—Dresden. 1st, 2nd, and 3rd class.

			A.M.	P.M.	
		Berlin	8 0	1 45	
103	63	Dob. Kirchain	9 42	12 8	38
			9 43	12 6 ↑	
122½	76	Elsterwerda	—	11 46	37
			—	11 42	
141	87½	Grossenhain	10 25 ↓	11 25	
			10 26	11 24	35
175	109	Dresden	11 3	10 45	

Including stops = 36⅓. Excluding stops = 37½.

There are several very fair expresses here. Specially good is the one from Berlin to Dresden *vid* Zossen (single line), a private company worked by the Government, and the Breslau express is very good, probably because by this route from Berlin to Vienna the Prussian administration gets more mileage than any other way, since the line does not touch Saxony. Moreover, the Austrian northern lines being private companies, they are willing to compete against each other ; if they were all under State administration the traffic would be forced on the line most profitable to Austria.

BEST EXPRESS.

Berlin—Dresden (*via* Röderau) 1st, 2nd, and 3rd class. (From Röderau to Dresden, Saxon State Railway.)

ERFURT ADMINISTRATION.

Kils.	Miles		Time		Speed
			P.M.	NOON	
		Berlin	5 25	12 15	
63	39½	Jüterbog	—	11 9	
			—	11 6	40
101	62¾	Herzberg	—	10 32	
			—	10 31	
112	69½	Falkenberg . . .	7 7	10 20↑	
			7 10	10 13	
125½	78	Burxdorf	—	9 59	39
			—	9 58	
141	87½	Röderau	7 38	9 44	
			7 42	9 40	
157	98¼	Priestwitz . . .	—	9 22	33
			—	9 21	
188	117	Dresden	8 36	8 45	
			P.M.	A.M.	

Including stops = 35. Excluding stops = 37½.

Note that running speed is 40 in Prussia and 33 in Saxony.

For in old days this was a competing train from Berlin to Dresden, though of course Saxony, which has always owned its railways, had no particular interest in running fast from the frontier. Even the Prussian portion of the journey is 5 minutes slower this year than last.

The speeds in Saxony, Bavaria, and Wurtemberg, where the State has long owned the railways, are deplorably bad, as we shall see afterwards, and it will be interesting to note whether in another 15 years those in Prussia become proportionately bad.

BEST EXPRESS.

BROMBERG ADMINISTRATION.

Berlin—Eydtkuhnen (St. Petersburg). 1st, 2nd, and 3rd class.

Kils.	Miles		Time		Speed
			A.M.	P.M.	
		Berlin (Schles) . . .	9 0	8 12	
82	51¼	Cüstrin	10 27	6 49	36¼
			10 33	6 43	
85	53¼	Cüstr. Vorstadt . . .	10 39	6 37↑	20
			10 40	6 36	
128	79¾	Landsberg	11 26	5 58	38
			11 27	5 57	
157	97½	Friedeberg. . . .	11 59	5 26	33
			12 0	5 25	
174	108¼	Vordamm	12 18	5 9	38

BROMBERG ADMINISTRATION—*continued.*

Kils.	Miles		Time		Speed
			P.M.	P.M.	
		Vordamm	12 19	5 8	} 35
187½	116½	Kreuz	12 34	4 55	
			12 54	4 49	} 39
246	155¼	Schneidemuhl . . .	1 51	3 55	
			1 59	3 35	} 35
278	172¾	Flatow	2 31	3 7	
			2 32	3 6	} 40
329	204¼	Konitz	3 23	2 23	
			3 29	2 15	} 39½
401	249¼	Pr. Stargard . . .	4 38	1 8	
			4 39	1 7	} 33
426	264⅝	Dirschau	5 6	12 39	
			5 14	12 31	} 27
443	275¾	Marienburg . . .	5 40	12 8	
			5 41	12 7	} 38
473	293¾	Elbing	6 13	11 41	
			6 14	11 40↑	} 30
485	301¼	Güldenboden . . .	6 26	11 22	
			↓ 6 27	11 21	} 38
527	327⅛	Braunsberg . . .	7 13	10 43	
			7 14	10 42	
560	347	Ludwigsort . . .	7 47	—	
			7 48	—	} 36
572	355¾	Kobbelbude . . .	—	10 0	
			—	9 59	
589½	365¾	Königsberg . . .	8 20	9 40	
			8 32	9 25	} 38
641	398	Wehlau	9 26	8 37	
			9 27	8 36	} 41
680	422	Insterburg	10 6	8 4	
			10 12	7 58	} 40
706	438¼	Gumbinnen . . .	10 38	7 35	
			10 39	7 34	} 39
742	460½	Eydtkuhnen . . .	11 15	7 2	
			P.M.	A.M.	

Including stops = 32. Excluding stops = 37.

This, the international mail express to Russia, is a very fine train, and third class. It is probably the best long-distance third-class train on the Continent. But compare it with the 8.0 P.M. London to Perth and it will not seem so good.

Miles		Time	Speed incl. stops
462½	King's Cross	8 0 P.M.	} 42
	Perth	7 0 A.M.	

The reason for its high speed and cheap fares is to be found in the fact that it is far more profitable for Prussia to take the traffic to St. Petersburg this way than *vid* Warsaw, since they get the mileage instead of handing it to the Russian railways.

BEST EXPRESS.

BRESLAU ADMINISTRATION.

1st, 2nd, and 3rd. Class.

Kils.	Miles		Time P.M.	Time A.M.	Speed
		Breslau	4 10	10 0	
26½	16½	Ohlau	4 41	9 32	31
			4 42	9 31	
41½	25½	Brieg	4 57	9 15	35
			5 0	9 12	
56½	35¾	Löwen	5 17	8 57	37
			5 18	8 56	
81½	50½	Oppeln	5 44	8 32	35
			5 48	8 28	
102	63½	Gogolin	6 11	8 7	35
			6 12	8 6	
113	70¼	Leschnitz		7 54	34
				7 53	
123	76¼	Cosel	6 34	7 42	
			6 38	7 30	
130	81	Birawa		7 20	31
				7 19	
141½	87½	Hammer	6 57	7 4	
			6 58	7 3	30
146	91	Nendza	7 5	6 55	
			7 7	6 53	33
155½	97	Ratibor	7 17	6 41	
			7 20	6 36	
164½	102	Tworkau		6 24	30
				6 23	
168	105	Kreuzenort	7 34	6 16	
			7 35	6 15	30
176	109½	Annaberg	7 44	6 5	
			7 45	6 4	20
181	113	Oderberg	7 52	5 56	

Including stops = 30. Excluding stops = 33.

LEFT RHINE ADMINISTRATION.

Cologne—Bingerbrück. 1st and 2nd class.

Kils.	Miles		Time A.M.	Time P.M.	Speed
		Cologne	9 0	12 40	33
33	21	Bonn	9 40	12 4	
			9 43	12 2	
53¾	33	Remagen	10 6		35
			10 7		
91	56	Coblenz	10 49	11 1	
			10 54	10 56	
92	56½	Coblenz	10 57	10 53	32
			11 0	10 47	
111¾	69	Boppard	11 21	10 23	
			11 22	10 22	
153	96	Bingerbrück	12 5	9 40	37½

Including stops = 32. Excluding stops = 34½.

LEFT RHINE ADMINISTRATION—*continued.*

Cologne—Herbesthal (Paris and London to Berlin). 1st and 2nd class.

Kils.	Miles		Time P.M.	Time P.M.	Speed
		Cologne	1 13	11 20	
39	24¼	Düren	1 53	10 39	35½
			1 55	10 36 ↑	
60	38	Stolberg	2 16		35
			↓2 17		
70	44	Aix	2 30	10 2	
			2 34	9 58	
85½	53¾	Herbesthal	2 58	9 32	23

Including stops = 31. Excluding stops = 32½.

This is part of a service which we give below, London-Calais-Berlin, only to be characterised as an international disgrace.

Though considerably less fast than most expresses, it has no third class accommodation, and it is curious to notice that this left Rhine Administration has 34 per cent. less third class mileage on its expresses than any other Prussian State Administration.

LONDON AND BERLIN (*viâ* CALAIS).

Best Service in each direction.

Kils.	Miles		Time	Speed incl. stops Kils.	Speed incl. stops Miles	
		Berlin . .	11 37 A.M.			
679	424	Herbesthal .	12 39 Ngt.	50	31	Prussian State Rlys.
			12 38 „			
		Brussels .	4 9 „	26	16	Belgian State Rys.
			7 46 „			
912	570	Blandain .	9 37 „			
			9 41 „	40	25	Northern of France
1,031	644	Calais . .	12 39 noon			
			1 20 P.M.	27	17	L.C.D. Co.'s ship
1,072	670	Dover . .	2 50 „			
			3 5 „			
1,195	747	Victoria .	4 50 „	70½	43½	L.C.D.
Average throughout, allowing for difference of time				41	25½	
		London .	8 10 P.M.			
		Dover . .	9 57 „	69	43	S.E. & L.C.D.R.
			10 0 „			
		Calais . .	11 40 „	24	15	
			12 44 A.M.			
		Blandain .	3 40 „	40	25	
			4 2 „			
		Brussels .	5 53 „	47	29½	
			6 5 „			
		Herbesthal .	9 10 „			
			9 26 „			
		Berlin . .	10 57 P.M.	52	32½	
Average throughout, allowing for difference of time				46	28¾	

Now, supposing that the Continental railways went at English speeds, the journey from London to Berlin and *vice versâ* would be from 10 to 12 hours quicker, or even supposing that they did it at the speed at which we go from London to Calais (sea included), it would be from 4 to 5 hours quicker.

From King's Cross to Wick, a remote fishing port, 767 miles (of which 300 are single line), is just a 22 hours' journey. Our international train from Berlin to Victoria (20 miles less distance) takes just 30 hours along the principal thoroughfare of Europe.

BEST EXPRESSES.

FRANKFORT ADMINISTRATION.

(Berlin—Frankfort) 1st, 2nd and 3rd class.

Kils.	Miles		Time		Speed
		Sangerhausen . . .	12 3	5 51	} 38
38	24	Nordhausen	12 40	5 13	
			12 45	5 8	} 35½
80	49⅘	Leinefelde	1 30	4 23	
			1 34	4 19	} 33
158½	98¼	Cassel	2 55	2 40	

Including stops = 33. Excluding stops = 34½.

Part of the best expresses, Berlin—Frankfort, *viâ* Magdeburg.

FRANKFORT ADMINISTRATION.

Best long distance express. Berlin—Frankfort. 1st, 2nd, and 3rd class.

Kils.	Miles		Time		Speed
			A.M.	P.M.	
		Berlin (Z. G.) . . .	8 49	11 51	} 17½
2½	1¾	Charlottenburg . . .	8 55	11 45	
			8 57	11 44	} 32
21	13	Potsdam	9 17	11 23	
			9 18	11 22	} 38½
67½	42½	Belzig	10 5	10 36	
			10 6	10 35	} 38
117	72¼	Gutergluck	10 50	9 44	
			10 51	9 43	} 36
135	83⅜	Stadt Calbe	11 9	9 22	
			11 10	9 21	} 37½
150	93¼	Güsten	11 27	9 3	
			11 32	8 58	} 35
165½	103½	Sandersleben	11 51	8 42	
			11 52	8 41	} 29
203	126	Sangerhausen . . .	12 41	7 53	
			1 1	7 37	} 35
219½	136	Rossla	1 19	7 20	
			1 20	7 19	} 35
241	149¾	Nordhausen	1 42	6 56	
			1 47	6 51	} 36
283	176¼	Leinefelde	2 34	6 6	
			2 38	6 4	} 33
299	186	Heiligenstadt . . .	2 53	5 43	

FRANKFORT ADMINISTRATION—*continued.*

Kils.	Miles		Time		Speed
			P.M.	P.M.	
		Heiligenstadt . . .	2 54	5 42	} 31
314	195	Eichenberg	3 11	5 23	
			3 14	1 56	} 32
329	204½	Allendorf	3 30	1 38	
			3 31	1 37	} 32
343	213¼	Niederhone	3 44	1 25	
			3 45	1 24	} 30
375	233	Bebra	4 27	12 40	
			4 40	12 20	} 25
385	239¾	Hersfeld	4 55	12 5	
			4 56	12 4	} 36⅓
431	268¼	Fulda	5 46	11 19 ↑	
			5 49	11 16	} 32⅔
459½	286½	Elm	↓ 6 24	10 45	
			6 32	10 37	} 31
497½	308½	Gelnhausen	7 15	9 49	
			7 16	9 47	} 32⅔
518½	322	Hanau	7 39	9 22	
			7 42	9 19	} 31
531½	331	Offenbach	7 57	9 2	
			7 58	9 1	} 25
537	334¼	Sachsenhausen . . .	8 5	8 53	
			8 8	8 52	} 13
540	335½	Frankfort	8 15	8 45	

Including stops = 29. Excluding stops = 33.

Note that these are not the fastest trains between Berlin and Frankfort.

Note that as there is no direct train from Frankfort to Berlin this way, we have taken the two best timings.

BEST EXPRESS.

ELBERFELD ADMINISTRATION.

Warburg—Cassel.

Kils.	Miles		Time		Speed
			A.M.	A.M.	
		Warburg	1 17	3 33 ↑	} 35
25	16	Hofgeismar	1 43	3 7	
			1 44	3 6	
52¼	33	Cassel	↓ 2 12	2 40	

Including stops = 36. Excluding stops = 37.

The poorest set of trains in Prussia comes from this administration, though it serves the richest industrial district.

One would like to see the effect of Leeds and Bradford being joined by two expresses per diem each way, as are Essen and Crefeld.

BEST EXPRESS.

OLDENBURG STATE RAILWAY.

1st, 2nd, and 3rd class. Bremen—Leer. Single line.

Kils.	Miles		Time		Speed
			P.M.	NOON	
		Bremen	6 5	12 15	14
5	3	Bremen (Neust.) . . .	6 16	12 0	
			6 17	11 58	31
16¼	10	Delmenhorst	6 30	11 45	
			6 32	11 43	31
30¼	18¾	Hude	6 48	11 28	
			6 50	11 27 ↑	35
47	29¾	Oldenburg	7 7	11 6	
			↓ 7 12	11 2	33
62	39¼	Zwischenahn	7 28	10 44	
			7 29	10 43	30
79	49	Augustfehn	7 46	10 20	
			7 48	10 19	33
102	63¼	Leer	8 13	9 52	

From Neustadt including stops = 30. Excluding stops = 32.

BEST EXPRESS.

UNTER ELBESCHE E.B. (Private Company).

Kils.	Miles		Time		Speed

Harburg—Cuxhaven (Berlin-Heligoland).

1st, 2nd, and 3rd class. Single line.

			A.M.	P.M.	
		Harburg	8 25	9 28 ↑	33
40½	25	Stade	9 7	8 43	
			9 8	8 42	33
102¼	63½	Cuxhaven	↓ 10 16	7 28	

Including stops = 32½. Excluding stops = 33.

MECKLENBURG FRIEDRICH FRANZ (Private).

1st, 2nd, and 3rd class. Single line.

			P.M.	P.M.	
		Hagenow	8 17	5 39 ↑	38
28¼	17¾	Schwerin	8 52	5 11	
			↓ 8 59	5 5	34
44¾	28	Kleinen	9 17	4 48	

Including stops = 30 Excluding stops = 33½.

NEUSTRELITZ-WARNEMUNDE (Private Company).

1st, 2nd, and 3rd class. Single line.

			A.M.	P.M.	
		Neustrelitz	10 24	6 40	32½
34	21¼	Waren	11 3	5 59	
			11 5	5 53 ↑	32
70	44	Lalendorf	11 47	5 13	
			↓ 11 53	5 9	32
113¼	70⅔	Rostock	12 45	4 15	
			12 51	4 9	32
126	78¼	Warnemunde . . .	1 5	3 55	

Including stops = 29. Excluding stops = 32.

All very fair trains, and every one has been slightly quickened this year, though in no case has a State train been quickened.

BEST EXPRESS.

LÜBECK BÜCHEN RAILWAY (Private Company).

Hamburg—Strasburg (Stettin). 1st, 2nd, and 3rd class.

Kils.	Miles		Time A.M.	Time P.M.	Speed
		Hamburg	8 30	7 19	21
4½	2¾	Wandsbek	8 38	7 12	
			8 39	7 11	
39	24½	Oldesloe	—	6 33	35
			—	6 29	
62¾	39½	Lübeck	9 42	6 3	
			9 50	5 54	35
82¼	51	Schonberg	10 12	5 35	
			10 13	5 34	35
99½	62	Grevesmühlen . . .	10 33	5 16	
			10 34	5 15	34
122	75¾	Kleinen	10 57	4 50	
			11 3	4 40	36
139¾	87	Blankenberg	11 21	4 22	
			11 22	4 21	36
162½	101½	Butzow	11 46	3 58 ↑	
			11 53	3 51	34
176	109¼	Güstrow	↓12 8	3 38	
			12 10	3 36	36
192	119½	Lalendorf	12 28	3 21	
			12 29	3 20	34
205	127½	Teterow	12 44	3 6	
			12 45	3 5	33
219	136	Malchin	1 0	2 48	
			1 5	2 44	30
230	143	Stavenhagen	1 20	2 32	
			1 21	2 31	36½
263¾	164	Neubrandenburg . . .	1 54	1 55	
			2 4	1 31	30
285¾	177¾	Oertzenhof	2 34	1 6	
			2 35	1 5	26
298	185	Strasburg	2 51 P.M.	12 49 NOON	

Including stops = 29. Excluding stops = 33¾.

A fine service, considering that from Lübeck to Strasburg is single line.

SWITZERLAND.

(All trains over 44 kils. or 28 miles admitted as 'express,' and some mountain trains under that speed.)

THE railways are all private companies, and we see the result in that a poor country with extremely bad gradients yet has nearly as good an express mileage in proportion to population as France, and is better than South Germany.

Too much praise can hardly be bestowed on the best Gothard express, which runs through the highest range of mountains in Europe, and over a single line, with corkscrew tunnels and gradients of 1 in 40 (rising from 1,400 feet at Lucerne and Fluelen to 3,800 feet at Göschenen), faster than many a train in Bavaria and Wurtemberg calling itself express does over level ground, and is actually faster than any ordinary express was in Spain or Portugal in August 1888.

The approaches to the line, however, are very slow, both by the Swiss Central and the Italian companies.

Of course, this high speed is the result of competition with the Mont Cenis, the Brenner, and the Soemmering routes, and has proved a godsend to English travellers in that it has accelerated the trains of the P.L.M. French company, and even of the Northern of France, owing to the competition *vid* Ostend.

Since this was written the news has arrived that the Swiss Government intend to buy the North-Eastern Company, as a preliminary step to the acquisition of the whole Swiss network.

GENERAL FIGURES OF EXPRESS MILEAGE.

Companies arranged in order of best average speed, excluding stops.

Company	Speed		Express mileage		
	incl. stops	excl. stops	3rd class	Per cent. of 3rd cl. to total	Total
Vereinigte Schweizer Bahnen	26	29⅓	—	—	138
Schweizer Central Bahn .	26½	28	—	—	180
Schweizer West Bahn .	26	28	—	—	126
Nord Ost Bahn . . .	26½	27½	157	34	459
Jura, Berne, Lucerne . .	24¾	25⅝	—	—	518
Gothard Bahn . . .	21	23½	—	—	864
	24⅖	26	157	7	2,285

The best express in Switzerland is unquestionably that given below.

BEST EXPRESS.

GOTHARD RAILWAY. 1st and 2nd class.

Note.—Since summer 1888, the 2nd class has been taken off this train.

Miles			Time	Speed
	Lucerne . .	Gothard Railway	9 20 A.M.	
11¼	Rothkreuz . .		9 42 „	30¾
			9 45 „	
36	Fluelen . .		10 30 „	33⅓
			10 32 „	
41½	Erstfeld . .		10 45 „	25⅓
			10 46 „	
59½	Göschenen . . (Tunnel)		11 35 „	23
			11 55 „	
97½	Biasca . .		1 23 P. M	26
			1 25 „	
109¼	Bellinzona . .		1 50 „	30
			1 55 „	
127¾	Lugano . .		2 40 „	24⅔
			2 42 „	
144	Chiasso . .		3 15 „	29½

Including stops = 24. Excluding stops = 27¼.

(For gradients see next page.)

SWISS CENTRAL RAILWAY.

(Ascends from 871 feet at Bâle to 2,008 at summit (Laufelingen, near Olten), and sinks thence to 1,437 feet at Lucerne.)

The same express.

	Bâle		7 0 A.M.	
24¾	Olten		8 3 „	23½
			8 6 „	
59	Lucerne		9 15 „	29⅔

Including stops = 26¼. Excluding stops = 26$\frac{9}{10}$.

Italian part of the journey, all down hill.

(From Chiasso, 764 feet; to Milan, 390 feet.

	Chiasso		3 55 P.M.	
3	Como	Joint line of the Adriatic and Mediterranéo systems	4 2 „	26
			4 6 „	
24¼	Monza		4 59 „	24
			5 0 „	
32½	Milan		5 15 „	33

Including stops = 24$\frac{3}{5}$. Excluding stops = 26.

If we compare the fastest trains over the three great mountain passes into Italy—the Gothard, the Cénis, and the Brenner—we find the unexpected result that, taking up and down hill together, the slowest speeds are over the French and Austrian passes, the quickest over the Swiss.

The Brenner speeds are a disgrace to the great and powerful

Miles	Between		Time	Speed Incl.
		Up hill.		
		Rise in feet	H. M.	
60	Lucerne—Göschenen (Gothard Ry.)	2,050	2 15	26½
61	Chambery—Modane (P.L.M.)	2,585	2 46	22
61	Wörgl—Brenner (Südbahn)	2,805	3 13	19
		Down hill.		
		Fall in feet		
67	Göschenen—Lugano (Gothard Ry.)	2,600	2 45	24½
60	Modane—Turin (Mediterranéo)	2,700	3 8	19
57	Brenner—Bozen (Südbahn)	3,600	2 43	21

Südbahn of Austria, and one might almost apply the words of the old song :—

Immer langsam voran,
Immer langsam voran,
Dass die österreichische Südbahn nachfolgen kann.

The gradients are as follows :—

The Gothard rises from 1,437 feet at Lucerne to 3,787 feet at the summit, and averages 1 in 45 Erstfeld to Goschenen, and 1 in 48 Giornico to Airolo. It falls to 777 feet at Bellinzona, only to mount again to the tunnel above Lugano—1,135 feet. Again it sinks rapidly to 705 feet at Como, and 390 feet at Milan.

The Cénis rises from 883 feet at Chambery to 4,163 at the summit at the south end of the tunnel ; its fall then averages 1 in 60 to Turin (785 feet).

The Brenner rises from 1,665 feet at Wörgl to 4,485 at Brenner, the summit, and falls to 880 feet at Bozen. The steepest grade of 1 in 40 occurs 5 times between Innsbruck and the summit ; thence to Sterzing it falls 1 in 44.

The following figures of the different heights in feet to which railways with ordinary locomotives ascend are believed to be correct :—

		Feet
Peru	Oroya Ry.	14,586
United States	Union Pacific (Rocky Mts.)	8,247
Do. Do.	Northern Pacific (Rocky Mts.)	5,560
Do. Do.	Denver & Rio Grande	—
Canada	Canadian Pacific (Mt. Stephen)	5,296
Austria	Südbahn (Brenner)	4,485
Do.	Staatsbahn (Arlberg)	4,300
France	P.L.M. (Mt. Cenis)	4,163
Switzerland	Gothard Ry. (St. Gothard)	3,787
Austria	Südbahn (Soemmering)	2,920
Scotland	Highland Ry. (Struan)	1,476
England	N.E.R. (Stainmoor)	1,369

By far the finest train over the hills is that of the Union Pacific.

(See p. 82.)

SOUTH GERMANY.

General Figures of Express Mileage.

Administration		Speed		Express mileage		
		incl. stops	excl. stops	Third class	Per cent. of 3rd cl. to total	Total
Elsass-Lothringen (Imperial)		31¾	34	410	24	1,738
Hesse Louis Railway	Private	31	33¾	295	43	681
Palatinate Railways	Private	30½	31¾	207	45	457
Baden State	State.	32	35	524	32	1,651
Main Neckar Railway	State.	32	34	55	20	275
Saxon State	State.	32	33	837	80	1,043
Bavarian State	State.	30¼	31½	111	4	2,840
Wurtemberg State	State.	30	31	128	32	400
		31⅕	33	2,567	28	9,085

The best express in South Germany is the 2.20 P.M. **Mannheim** to Bâle, first and second class, run by the Baden State Administration. The best third class express is the 6.15 P.M. **Leipsic to Tetschen**, run by the Saxon State Administration. (See pp. 139, 141.)

BEST EXPRESS.

Elsass-Lothringen (Imperial) Administration.

Luxemburg—Bâle, 1st and 2nd class (London to Switzerland and Italy *viâ* Ostend).

Kils.	Miles		Time		Speed
		Luxemburg	11 43 P.M.	2 59 A.M.	
66¼	42	Metz	12 52 „	1 51 „	37
			12 58 „	1 46 „	
154	96¼	Saarburg	2 27 „	12 24 „	38
			2 30 „	12 21 „	
180¾	112	Zabern	3 0 „	11 52 „	33½
			3 2 „	11 50 P.M.	
224¾	139¼	Strasburg	3 48 „	11 5 „	36
			3 55 „	10 57 „ ↑	
268	167	Schlettstadt	4 37 „	10 13 „	38
			4 38 „	10 12 „	
280¼	174	Colmar	5 1 „ ↓	9 49 „	34
			5 3 „	9 47 „	
315¾	196	Bollweiler	5 28 „	9 21 „	36
			5 30 „	9 19 „	
333	207	Mühlhausen	5 51 „	8 58 „	31½
			5 56 „	8 54 „	
360½	224½	St. Ludwig	6 26 „	—	35
			6 28 „	—	
365½	227½	Bâle	6 35 A.M.	8 20 P.M.	

Including stops = 33⅔. Excluding stops = 36.

Not so good as the Est and Nord, France, competitive express from Calais (see p. 104), but yet a good service.

We give here a comparison of the two services London to Bâle. It will be noticed that the speed from Dover to Bâle *viâ* France worked by four private companies, is greater by 3 miles an hour including, and by 5 excluding, stops, than that of the route *viâ* Belgium, worked by the Belgian and Imperial German Government Administrations, although the Belgian and German route is less steep, and has Brussels and Strasburg on the way, while the route *viâ* France goes through no town of first-rate importance.

viâ France.

Miles		Time	Speed incl.	
	Victoria . . .	11 0 A.M.	$42\frac{1}{2}$	L.C.D.
78	Dover . . .	12 50 „		
		12 55 noon	$18\frac{3}{4}$	L.C.D.
103	Calais . . .	2 15 P.M.		ship
		3 5 „	36	Nord
272	Laon . . .	7 59 „		
		8 5 „	39	Est
545	Delle . . .	3 20 A.M.		
		3 55 „	22	Jura—Berne—Lucerne
595	Bâle . . .	6 15 „		

viâ Germany.

Miles		Time	Speed incl.	
	Charing Cross .	9 40 A.M.	40	S.E.R.
76	Dover . . .	11 34 „		
		11 40 noon	$16\frac{1}{3}$	Belgian Govt. ship
144	Ostend . . .	3 50 P.M.		
		4 24 „	31	Belgian State Railway
220	Brussels . . .	6 19 „		
		7 4 „		
345	Bettingen . .	10 52 „		
		11 14 „	$32\frac{3}{4}$	Elsass-Lothr. Admin.
453	Strasburg . .	3 48 A.M.		
585	Bâle . . .	6 35 „		

Miles		Speed incl.	Speed excl.
595	Victoria—Bâle, *viâ* France . .	$31\frac{4}{5}$	$37\frac{1}{5}$
585	Charing Cross—Bâle, *viâ* Germany .	$28\frac{1}{2}$	$32\frac{1}{2}$
492	Calais—Bâle	$33\frac{1}{3}$	38
441	Ostend—Bâle	$31\frac{1}{2}$	$36\frac{1}{4}$

From St. Pancras to Londonderry, 10 miles farther (6 more sea crossing) *viâ* Stranraer, is 25 minutes less in time, and cheaper by £2 1 0 first, £2 0 0 second, while third class are taken, though the Government railways abroad are first and second only. Thus, notwithstanding Irish slow speed and the small traffic, a poor person

can reach Derry from London for 29*s.* 6*d.* in greater comfort than he can go to Bâle second class for 85*s.*

	s.	*d.*
The Sleeping Car Fare from London to Stranraer is .	5	0
Do. Do. Ostend or Calais to Bâle is	16	5

It should be noticed here that the Alsace-Lorraine railway (controlled from Berlin) competes to some extent with the Baden lines for north and south traffic, as will be seen by the map. It controls also all traffic from France to Western Europe, except that which passes *viâ* the Arlberg tunnel or *viâ* the Swiss lines.

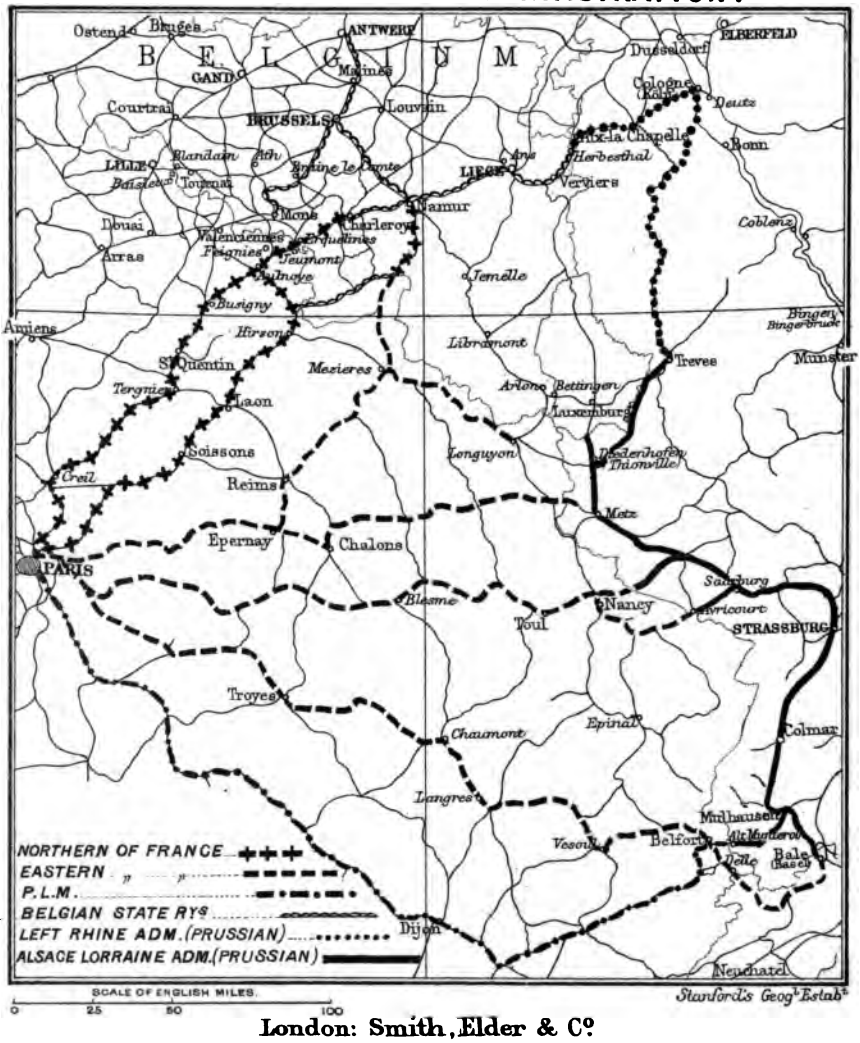
It is thus able in some sense to dictate terms to the Baden and Wurtemberg roads. Of course these Alsace lines used to belong to the Eastern of France Company, in those days a very active corporation, but after the war they were made subject to an Imperial German administration, intended to be the nucleus of an Imperial German railway system. The attempt has not succeeded, the individual feeling in the southern states being too powerful. Nevertheless, from the point of view of railway politics, the power of the Alsace-Lorraine administration is very important. It can prevent the Eastern of France Company from starting services from Paris to Saxony and Russia *viâ* Baden, Wurtemberg, and Bavaria, a course which would naturally deflect traffic from the Prussian lines between Cologne and Berlin on to Baden, Bavarian, and Austrian roads.

BEST EXPRESSES.

Kils.	Miles		Time		Speed
		HESSE-LOUIS RAILWAY (Private).			
		Mainz—Mannheim. 1st and 2nd class.			
			NOON	P.M.	
76	47	Mainz	12 54	3 2↑	36
		Mannheim	↓ 2 15	1 45	
		Excluding and including stops = 36 miles.			
		PALATINATE RAILWAYS.			
		Neustadt—Weissenburg. 1st and 2nd class.			
			NOON	NOON	
		Neustadt	11 47	1 20	
		Edenkoben	11 58		32
			11 59	↑	
18½	11½	Landau	12 10	1 1	
			12 11	12 59	
		Winden	↓12 25		36
			12 26		
46¾	29½	Weissenburg . . .	12 42	12 30	
		Including stops = 33.	Excluding stops = 33½.		

These are both private railways, the largest of such corporations left in Germany. Considering the way in which the Hesse-Louis Railway appears to be boycotted by the State roads on either side,

STRATEGIC POWER IN RAILWAY POLICY OF ALSACE LORRAINE ADMINISTRATION.



London: Smith, Elder & Co.

BEST EXPRESS.

SAXON STATE RAILWAY.

Leipzig—Dresden—Tetschen for Vienna. 1st, 2nd, and 3rd class.

Kils.	Miles		Time P.M.	Time A.M.	Speed
		Leipzig	6 15	10 34	
65¾	41½	Riesa	7 29	9 30	36
			7 30	9 29	
115	71½	Dresden (Lpz.) . . .	8 24	8 37	34
			8 31	8 31 ↑	
118¾	73½	Dresden (Böhm) . . .	8 39	8 23	15
			9 0	8 14	
136	84½	Pirna	↓ 9 20	7 57	35
			9 21	7 56	
158½	98¾	Schandau	9 50	7 30	31
			9 51	7 29	
180	112	Tetschen	10 18	7 3	30

Including stops = 30. Excluding stops = 33½.

BEST EXPRESS.

BAVARIAN STATE RAILWAY.

Ulm—Munich—Simbach. Orient express. 1st class only. Exp. fares.

Kils.	Miles		Time		Speed
		Ulm . . .	10 51 A.M.	4 0 A.M.	
84½	53	Augsburg . .	12 27 „	2 24 „ ↑	33
			12 30 „	2 21 „	
146½	91	Munich . . .	1 38 „	1 14 „	33½
			↓ 1 43 „	1 8 „	
269¾	168	Simbach . .	4 2 P.M.	10 49 P.M.	33¼

Including stops = 32½. Excluding stops = 33¼.

The Bavarian, Wurtemberg, and Saxon railways are a disgrace to Europe as far as speed goes. It is positively two hours quicker to go from London to Vienna all the way round by Paris (100 miles further) owing to the slowness of the trains in Bavaria and Wurtemberg.

The Government of these conntries have always owned their railways and worked them, and we have a good illustration of the sort of effeteness that State management produces after a time. There is practically no fast third-class accommodation in Bavaria or Wurtemberg.

The 'Orient express' runs faster in Roumania than in Wurtemberg.

Saxony is one of the richest and most populous parts of Germany, and yet the trains are extremely slow. Let us hope that North Prussia will not sink to the same level.

IRELAND.

GENERAL FIGURES OF EXPRESS MILEAGE.

Company	Speed		Express mileage		Total
	Incl. stops	Excl. stops	3rd cl.	Per cent. of 3rd class to total	
Great Southern and Western	34⅘	37	414	47	886
Midland Great Western	32⅕	35⅕	—	—	597
Great Northern of Ireland	34	35	665	100	665
Belfast and Northern Counties	30	33	360	91	395
Waterford and Limerick	30	33	122	94	144
Belfast and County Down	30	32	61	100	61
Dublin, Wicklow and Wexford	29	29	24	100	24
Grand Total	33	35	1,646	69	2,772

It is almost impossible to deal with Irish trains in any satisfactory manner, since the results are too poor to allow them to be classed with those of the sister island. For this reason we have put them among those of the Continent, and even then the result is most disappointing, since they come so low in the list as to be beaten by France, Germany, Holland, Belgium, and Switzerland. As the gauge (5 feet 3 inches) is admirably suited for fast running, and the gradients are good, while the three great centres of population, Belfast, Derry, and Cork, are all sufficiently near the capital city to allow the development of a traffic if encouraged by facilities, it must be concluded that there has been a conspicuous want of energy, especially as the best roads are by no means bankrupt concerns, but pay considerable dividends.

Moreover the fares are excessive for a poor country, being higher in the first and second classes than any other European country (see p. 95); and of the long distance 'expresses' in this poor country we find that actually more than 50 per cent. are first and second only at express fares, while in the much richer sister isle only 7 per cent. are not third class.

In the recent report of the Royal Commission it was pointed out that Dublin was the only capital in Europe from which trains started at night without third class accommodation, and it is comforting to note that the present winter time-table shows that this has not been left unheeded, the Great Northern, for instance, having made all its trains third class.

Had the London and North-Western of England ever been able to accomplish the purchase of the Midland Great Western, a more active régime would no doubt have been inaugurated, and we should

not have rejoiced in the extraordinary spectacles in the way of timing, which are so truly Irish—*e.g.*, on the Great Northern a train with five stops is allowed less time to do a journey of 54 miles than a lighter train with only four stops.

We give the only three expresses worth recording; the best in Ireland is the American mail, Dublin to Cork on Sundays only (see p. 65), and next to this is the ordinary express to Cork, given below.

BEST EXPRESSES.

Great Southern and Western.

Miles		Time	Speed
		A.M.	
	Dublin . .	7 40	
30¼	Kildare .	8 23	42⅕
		26	
51	Maryborough	8 56	41½
		58	
107¼	Limerick Jn. .	10 15	43⅘
		22	
165½	Cork . .	11 45	42

Incl. stops = 40⅓
Excl. „ = 42¼

Great Northern of Ireland.

Miles		Time	Speed
		A.M.	
	Dublin . .	7 25	
32	Drogheda .	8 13	40
		14	
54	Dundalk .	8 48	38⅘
		51	
87¼	Portadown .	9 45	37
		48	
113	Belfast . .	10 25	41¾

Incl. stops = 37⅔
Excl. „ = 39⅕

Midland Great Western.

Miles		Time	Speed
		A.M.	
	Dublin . .	7 40	
26½	Enfield . .	8 26	34½
		28	
50¼	Mullingar .	9 3	40¾
		9	
76¼	Longford .	9 51	37⅐
		52	
87¼	Dromod .	10 10	36⅔
		11	
97¾	Carrick . .	10 29	35
		30	
106½	Boyle . .	10 45	35
		46	
112	Kilfree . .	10 57	30
		59	
120	Ballymote .	11 12	37
		13	
134¼	Sligo . .	11 40	31⅔

Incl. stops = 33⅗
Excl. „ = 35⅘

DENMARK.

DANISH STATE RAILWAYS.

General Figures.

Speed		Express mileage		
Incl. stops	Excl. stops	3rd class	Per cent. of 3rd class to total	Total
30⅕	31½	845	100	845

BEST EXPRESS.

1st, 2nd, and 3rd class.

Vamdrup (Germany)—Copenhagen, 122½ miles.

Miles		Time	Speed
		A.M.	
	Vamdrup	3 42	} 32
11¾	Kolding.	4 3	
		4 4	} 35
24¼	Fredericia	4 25	
	(1¼ mile sea)	4 40	} —
	Strib	5 0	
From Strib		5 8	} 35
33¼	Odense	6 6	
		6 10	} 35
52	Nyborg	6 42	
	(19 miles sea)	6 50	} —
	Korsör	8 5	
From Korsör		8 10	} 30
49	Roskilde	9 56	
		9 57	} 35
68¾	Copenhagen	10 30	

Including stops = 24¼. Excluding stops = 33¼.

Total, 165 miles, including two separate crossings of the sea.

This is one of the most creditable trains of smaller countries.

There seem to be two reasons for the excellence of Danish trains; first, that there is very severe sea competition on all sides, especially from Kiel, for through traffic from Europe to Copenhagen and Scandinavia generally; and secondly, that an educated aristocracy, such as exists in Denmark, insists on being treated in a reasonable way.

AUSTRO-HUNGARY.

General Figures of Express Mileage.

Companies arranged in order of best average running speed, excluding stops.

Administration		Speed		Express mileage		
		incl. stops	excl. stops	Third class	Per cent. of 3rd cl. to total	Total
Private Companies	Austro-Hungarian State	32¾	34¾	1,799	44	4,062
	Emperor Ferdinand's Northern	32½	34	763	95	799
State	Hungarian State	29⅗	32	995	53	1,915
	K.K. Œst. Staatsbahnen	29½	31½	1,570	40	3,991
Private Companies	Austrian North-West	29¼	30½	223	33	669
	Buschterader Bahn	29	30	—	—	93
	Südbahn	25⅓	27¾	947	41	2,303
	Grand Total	30	32	6,297	46	13,832

The best express is given on p. 147, viz. 12.51 noon Bodenbach to Brünn, run by the Austro-Hungarian State Railway Company ; part of an express from Berlin to Vienna.

The railways in Austro Hungary are some under private and some under Government control. Those towards the west have now been almost all acquired by the State, but towards the north three great lines compete for the traffic from Vienna northwards, and we get some very fine speeds, especially as the Prussian Administrations, having no interest in encouraging the route from Berlin to Vienna *vid* Saxony, do all they can to make a good service *vid* Oderberg from Berlin.

The slowness of Saxon Government administration is almost incredible. It might with the assistance of the Northern Austrian companies get practically the whole of the Berlin traffic to the south of Europe, since it is the shortest way, and Prussia could never decline to run fast trains to Dresden or Leipsic, which the Saxons would only have to forward decently. But they seem incapable, as the following table of the speed of best express (8 A.M.) from Berlin to Vienna (*vid* Saxony) shows. It will be noticed that the speed including stops is actually not so great as between London and Paris, although there is the sea crossing in the latter case.

Miles		Time	Speed	
	Berlin . . .	8 0 A.M.		
	Dresden . .	11 3 „	37	Prussia
		26 „		
	Bodenbach . .	12 40 P.M.	32	Saxony
		51 „		Austro-Hungarian State Railway (Private)
	Brünn . . .	7 24 „	39	
		28 „		Kaiser Ferdinand's Nordbahn
476	Vienna . .	10 0 „	38	

Compare with :—

Miles		Time
	St. Pancras . . .	8 25 P.M.
479	Perth	8 35 A.M.

Average.

	Incl. stops	Excl. stops
England and Scotland . .	39½	44
Austria and Germany . .	34	37¼

It must be added that these northern companies of Austria have no longer the same power of making alliances and treaties in order to reach North German towns since Prussia acquired her roads, so that they compete under difficulties.

In South Austria and Hungary the four great powers are (1) the Austrian State Railway, a Government road formed of the old Kaiserin Elizabeth and other small companies ; (2) the powerful Südbahn, always competing for traffic with its neighbour, the (3) Austro-Hungarian State Railway (private) ; (4) the Hungarian State Railway. The best trains of these companies over the mountains are very good, but their performances on level ground are but poor. The Austro-Hungarian gives in all respects the finest services in Austria both towards north and east.

The Südbahn trains are not as good as they were. In old days, when there was more competition, they used to run a fast train from Vienna to Innsbrück by their own route throughout.

Moreover, the Brenner route to Italy, which the Südbahn own, has the worst trains of any, nearly eight miles an hour slower than the Gothard. (See p. 134.)

There appears to be great jealousy here of Bavaria, for the Austrians seem to think that if they improve the service over the Brenner, the traffic from North Germany would simply be diverted from their own longer mileage route *vid* Vienna.

The first train opposite is the best of the competitive expresses from N. Germany, for this railway has the advantage of having Prague on its direct route from Vienna to Berlin. From Brünn to Vienna this express is taken on under arrangement by the Emperor Ferdinand's Northern Railway, a slightly shorter route ; but it also

has two very creditable expresses by its own route, as well as two between Prague and Vienna.

BEST EXPRESS.

AUSTRO-HUNGARIAN STATE RAILWAY (Private).

(Berlin) Bodenbach—Brünn (Vienna). 1st, 2nd, and 3rd class.

Kils.	Miles		Time	Speed
		Bodenbach	P.M. 12 51	
23	14¼	Aussig	1 14	36
103	64	Kralup	16 2 33	38
130	80¾	Prague	34 3 3	34
192	119½	Kolin	9 4 7	41
235	146	Pardubitz	8 4 48	41
269	167½	Chotzen	50 5 21	41
294	183	B. Trübau	28 5 51	40
384	239	Brünn	53 7 24	37

Including stops = 37. Excluding stops = 39.

BEST EXPRESS.

AUSTRO-HUNGARIAN STATE RAILWAY (Private).

Vienna—Orsova (Bucharest). Eastern Section. 1st and 2nd class.

Kils.	Miles		Time	Speed
		Vienna	8 30 A.M.	
11	6¾	Stadlau	8 44 „	28
46	29	Marchegg	45 „ 9 17 „	40
65	41½	Presburg	39 „ 10 2 „	31
114	70¾	Galantha	5 „ 10 46 „	42
146	90½	Tot Megyer	51 „ 11 21 „	40
156	97	Neuhausel	22 „ 11 33 „	35
200	124¾	Gran Nana	39 „ 12 17 P.M.	43
245	152¼	Waitzen	19 „ 1 2 „	39
278	172	Pesth	3 „ 1 36 „	37
286	177¼	Steinbruch	50 „ 2 0 „	30
350	218	Czegled	1 „ 3 4 „	39
383	238	Keckskemet	10 „ 3 43 „	37

AUSTRO-HUNGARIAN STATE RAILWAY (Private)—(*continued*).

Kils.	Miles		Time	Speed
		Kecskemet	3 45 P.M.	
408	254	Felegyhaza	4 8 „	40
			9 „	
468	291	Szegedin	5 7 „	39
			12 „	
522	323¾	Nagykikinda	6 7 „	37
			8 „	
542	336¾	Zsomboly	6 27 „	37
			28 „	
581	360¾	Temesvar-Josefst	7 10 „	35
			20 „	
640	397½	Lugos	8 32 „	33
			33 „	
679	421½	Karansebes	9 20 „	39
			25 „	
718	445	Porta Orientalis	10 30 „	23
			31 „	
751	465	Herkulesbad	11 20 „	21
			21 „	
770	477	Orsova	11 44 „	30

Including stops = 32. Excluding stops = 34.

This train is actually faster than the Orient express, which only runs twice a week. The line forms the great main artery between East and West Europe.

BEST EXPRESS.

EMPEROR FERDINAND'S NORTHERN RAILWAY.

Brünn—Vienna, 144 kils. = 90 miles. 1st, 2nd, and 3rd class.

Kils.	Miles		Time		Speed
			P.M.	A.M.	
		Brünn	7 28	10 45	
18	—	Rohrbach	—	10 22	37
			—	10 ↑	
61	37½	Lundenburg	8 30	9 39	
			8 34	9 34	38
113	70¼	Gärserndorf	↓ 9 24	8 45	
			9 27	8 42	
144	90	Vienna	10 0	8 10	36

Including stops = 36. Excluding stops = 37.

Part of the best expresses between Vienna and Berlin.

There is another set of expresses to Berlin run by this railway *viâ* Oderberg.

BEST EXPRESSES.

K.K., ŒST. STAATSBAHN.

Prague—Gmünd (Vienna). 1st, 2nd, and 3rd.

Kils.	Miles		Time	Speed
			P.M.	
		Prague	1 30	
52	33	Beneschau	2 26	36
			27	
67	42	Wottic	2 42	37
			43	
105	65¼	Tabor	3 23	36
			24	
124	77	Sobeslau	3 45	35
			46	
131	82	Wessely	3 53	37
			57	
152	95	Wittingau	4 17	39
			18	
186	116	Gmund	4 50	40

Including stops = 35. Excluding stops = 37.

This is the best express run by the Austrian Government Railway, being competitive with the Austrian North-Western and the Austro-Hungarian State Railway.

The general service from Vienna to the north-west of Europe is very bad, and it is strange that there is no express to Frankfort and Cologne over this route, as the Austrians would get more mileage than they do now.

But the whole of the speeds on this Austrian Government Railway are very poor, the average even on the main line between Vienna and Munich being 32½, while the Orient express runs faster in Roumania than in Austria.

KAISERLICH KÖNIGLICH OESTERREICHISCHE STAATSBAHN. (State).

(Paris) Buchs—Salzburg (Vienna *viâ* Arlberg). 1st and 2nd class.

Kils.	Miles		Time	Speed
			P.M.	
		Buchs	1 29	33
18	11¼	Feldkirch	1 50	
			57	30
29	18	Nenzing	2 11	
			12	24
40	25	Bludenz	2 30	
			31	14½
66	42	Langen	3 39	
		(Tunnel)	44	19
77	48	St. Anton	4 5	
			6	18
105	65¼	Landeck	5 6	
			8	32
132	82	Œtzthal	5 37	
			5 38	33
178	110⅓	Innsbrück	6 30	
			40	34
212	131¾	Jenbach	7 18	
			19	37
239	149	Wörgl	7 45	
			48	24
274	170¼	Kitzbühel	8 43	
			48	23
319	198	Saalfelden	10 3	
			4	32
332	206⅓	Zell	10 19	
			21	29
356	222	Lend Gastein	10 51	
			53	32
379	236	Bischofshofen	11 20	
			21	32
414	257¼	Hallein	12 2	
			3	33
432	268⅓	Salzburg	12 24	

Including stops = 20¾. Excluding stops = 26¼.

Over mountains throughout.

This train is part of a service between Paris and Vienna which, by means of the Arlberg Railway, avoids Germany altogether as it goes through Switzerland. It is of extreme importance to the public, since Prussia practically controls all other routes from Paris to Austria and Prussia by its ownership of the Alsace-Lorraine roads.

The great mistake which the Austrians seem to have made is in connecting at Bâle with the Est of France—which also works the Strasburg route from Paris to Vienna, and thus has no interest in encouraging this new way—instead of with the P.L.M. of France, whose route, though slightly longer, would have been entirely independent throughout. (See map.)

Moreover, the Austrian Government now owns the approaches to Vienna from both routes.

Had the Südbahn owned this Arlberg Railway, and the old Kaiserin Elizabeth Bahn owned the northern route *viâ* Simbach, we should have seen a very different set of services.

Even as it is, the fare from Paris to Vienna by the Arlberg, though 116 kils. further than by Munich, is the same as by that route. There is no reason why this train should not be greatly accelerated. The Gothard express averages from Bâle to Milan (236 miles) 3 miles per hour quicker than this train. The line rises from 1,350 feet at Salzburg to the first summit of 3,170 feet at Hochfilzen; falls again to 1,905 feet at Innsbrück, and rises to its summit 4,300 feet near Langen. The steepest gradient from Bludenz (Swiss side) to Lanzen is 31 in 1,000; from Landeck (Austrian side) to St. Anton the steepest is 26 in 1,000 (the same as the Gothard).

BEST TRAIN.

HUNGARIAN STATE RAILWAY.

Buda Pesth—Belgrade. Orient Express. 1st class, and only once a week.

Kils.	Miles		Time	Speed
			P.M.	
		Buda Pesth	5 35	$33\frac{1}{2}$
108	67	Kis Körös	7 36	
			41	
174	108	Maria Theresiopel	8 49	36
			54	
276	$173\frac{1}{2}$	Neusatz	10 46	36
			51	
347	216	Semlin	12 19	30
352	$219\frac{1}{2}$	Belgrade	12 32	

Including stops = $31\frac{1}{2}$. Excluding stops = 34.

A very creditable performance; indeed, all the speeds on this Government railway are good.

As regards the Orient express, it should be noticed that these far-off countries have more interest in encouraging a good connection with Western Europe than the countries nearer Paris, and so we have the strange spectacle of speeds improving in this train as we get farther east.

This railway also wishes to become part of the main route from Western Europe to the East *viâ* Salonica.

BEST EXPRESS.

AUSTRIAN NORTH-WEST RAILWAY.

Vienna—Tetschen (Berlin). 1st and 2nd class.

Another route, Berlin—Vienna.

Kils.	Miles		Time	Speed
		Vienna	9 0 P.M.	
15	9¼	Korneuburg	9 21 „	27
			22 „	
26	15½	Stockerau	9 33 „	33
			34 „	
100	62	Znaim	11 3 „	32
			8 „	
138	86¼	Mährisch Budwitz	11 56 „	30
			58 „	
198	124	Iglau	1 18 A.M.	28½
			19 „	
224	139	Deutschbrod	1 50 „	30
			55 „	
266	165¾	Goltsch	2 47 „	31
			50 „	
278	172½	Caslau	3 5 „	30
			6 „	
288	178¾	Sedletz	3 17 „	30
			19 „	
298	185	Kolin	3 32 „	29½
			33 „	
307	190½	G. Wossek	3 44 „	30
			49 „	
323	200½	Nimburg	4 8 „	32
			9 „	
372	231	Melnik	5 2 „	34
			5 „	
407	253½	Leitmeritz	5 47 „	30
			49 „	
432	268½	Schreckenstein	6 14 „	36
			15 „	
458	285	Tetschen	6 49 „	29

Including stops = 29. Excluding stops = 31.

BEST EXPRESS.

BUSCHTEHRADER BAHN.

Carlsbad—Eger. 1st and 2nd class.

Kils.	Miles		Time	Speed
			A.M.	
		Carlsbad	11 28	
22	14	Falkenau	11 56	30
			57	
46	29	Tirschnitz	12 26	30
			28	
52	33	Eger	12 36	30

Including stops = 29. Excluding stops = 30.

It is an act of grace to admit this train, which is really part

of trains labelled 'express 1 and 2' from Prague to Eger, which do not attain 28 miles an hour.

Saxony seems to have spread its influence over this part of Austria in the matter of speeds.

BEST TRAIN.

SÜDBAHN (Private).

Vienna—Trieste (Soemmering). 1st, 2nd, and 3rd class.

Kils.	Miles		Time	Speed
		Vienna	6 45 P.M.	
50	31	Neustadt	7 45 „	31
			49 „	
76	47	Gloggnitz	8 28 „	26
			29 „	
88	54½	Payerbach	8 41 „	36
			42 „	
114	70¾	Soemmering	9 37 „	18
			41 „	
133	82⅓	Mürzzuschlag	10 6 „	27
			16 „	
175	108⅓	Brück	11 3 „	33
			6 „	
228	141½	Graz	12 6 A.M.	33
			14 „	
293	182	Marburg	1 29 „	32
			35 „	
312	193¾	Pragerhof	1 56 „	33
			2 3 „	
327	203	Poltschach	2 20 „	33
			21 „	
361	224	Cilli	3 0 „	33
			1 „	
387	240¼	Steinbrück	3 36 „	28
			37 „	
448	278¼	Laibach	4 53 „	30
			58 „	
486	301¾	Loitsch	5 51 „	28
			52 „	
513	318½	Adelsberg	6 25 „	30
			27 „	
524	325½	St. Peter	6 45 „	23
			53 „	
550	341½	Divazza	7 20 „	34
			22 „	
558	346⅕	Sessana	7 34 „	25
			35 „	
577	358¼	Nabresina	7 59 „	30
			8 16 „	
596	370½	Trieste	8 41 „	29

Including stops = 26½. Excluding stops = 29½.

Considering the double range of mountains to be crossed, this is a good service.

Between Payerbach and Soemmering (the summit, 2,920 feet)

there are $13\frac{1}{4}$ miles of 1 in 47 ; from Soemmering to Murzzuschlag, $8\frac{1}{3}$ miles of 1 in 50.

There is one train (not given here) whose running between stations is faster, viz. from Pragerhof to Pesth, a route of which we may hear more when Salonica becomes a port for the East.

It is to be noticed that the running average of another mountain train, Vienna-Venice, which the Südbahn run, is only $26\frac{1}{2}$; since as part of that route belongs to the State, it is not to their interest to encourage it against their own longer mileage route.

Of the slowness of trains over the Brenner Pass, which the Südbahn work, we have spoken above when treating of the Gothard train.

BEST EXPRESS.

ROUMANIAN STATE RAILWAYS.

Verciorova—Giurgevo (Paris—Constantinople, Orient Express. 1st only.)

Kils.		Time	Speed
		P.M.	
	Giurgevo	2 25	
	Comana		$33\frac{1}{2}$
78	Bucharest	3 52	
		4 5	
125	Titu	5 2	32
		7	
186	Pitesci	6 20	32
		24	
267	Slatina	8 6	30
		10	
329	Craiova	9 27	30
		33	
	Filiasi	(4)	
	Polota	(2)	30
442	Turin Severin	12 4	
		6	
460	Verciorova.	12 28	31

Including stops = 29. Excluding stops = $30\frac{1}{2}$.

Very creditable indeed, considering that it is all single line. This train will probably cease beyond Bucharest, when the Orient express can reach Constantinople over the Servian junctions direct.

ITALY.

General Figures of Express Mileage.

Company	Speed		Express mileage		
	incl. stops	excl. stops	3rd class	Per cent. of 3rd cl. to total	Total
Mediterranean . . .	29⅘	31½	608	21	2,827
Adriatic	29	31	605	33	1,818
Sicilian	30	31	—	—	60
Total . .	29½	31¼	1,213	26	4,705

Italian railways have gone through such vicissitudes that their whole history would take up too much space here, but the final arrangement was to divide the country into two great systems, each working lines from Milan to the principal southern cities.

The Mediterraneo (or Western) Company is very closely allied to the P.L.M. of France, and is in every respect the most enterprising.

This company promised a 'Treno Lampo' (lightning train) between Turin and Rome after December 1, 1888. This heavenly display was to startle the universe by leaving Turin at 9.10 A.M. and reaching Rome 10.40 P.M., a distance of 413 miles in 13½ hours, or just 30½ miles per hour inclusive.

The Government, however, retain such large control that competition does not work freely, and the general service is very poor indeed. To anyone who knows North Italy this will be apparent.

There is only one day express along the plain of Lombardy, one of the richest countries in the world, from Milan to Venice, and no fresh trains ever seem to be added.

The connections are atrocious, i.e. a passenger from London to Venice has to wait six hours at Milan.

But yet there is hope for improvement if the companies are allowed a free hand, and have to meet the growing competition of Marseilles and Salonica, as well as of the excellent steam tramways which are now being developed over the whole country.

The best express in Italy is the 9.50 P.M. Rome to Pisa (Paris-London), and the best third-class express the 11.25 P.M. Milan to Venice, both given on the next page.

BEST EXPRESS.

MEDITERRANEO.

Rome—Pisa. 1st and 2nd class.

Kils.	Miles		Time	Speed
			P.M.	
		Rome	9 50	
48	30¼	Palo	10 47	32
			49	
81	50⅓	Civita-Vecchia	11 25	33
			29	
151	94	Orbetello	12 42	35
			47	
189	117⅓	Grosseto	1 30	35
			33	
231	143¾	Follonica	2 25	30
			26	
248	154	Campiglia	2 45	34
			50	
283	176	Cecina	3 24	35
			26	
319	198	Colle Salvetti	4 7	33
			9	
334	207½	Pisa	4 26	33

Including stops = 31½. Excluding stops = 33½.

BEST EXPRESS.

ADRIATICO.

Milan—Mestre—Venice. 1st, 2nd, and 3rd class.

Kils.	Miles		Time	Speed
			P.M.	
		Milan	11 25	
32	20	Treviglio	11 59	31
			12 1	
65	41	Rovato	12 36	36
			37	
82	51½	Brescia	12 55	35
			1 1	
110	68¾	Desenzano	1 36	30
			37	
124	77½	Peschiera	1 55	30
			56	
147	91¾	Verona P. N.	2 27	28
			29	
149	93½	Verona P. V.	2 32	35
			40	
198	123½	Vicenza	3 35	33
			39	
228	142	Padua	4 13	33
			17	
257	160	Mestre	4 48	35
			58	
265	165	Venice	5 10	28
			A.M.	

Including stops = 28⅔. Excluding stops = 31½.

ADRIATICO. 1st and 2nd class (from Dec. 1, 1888).

Miles		Time	Speed
	Milan	9 10 A.M.	
21	Lodi	9 44 „	37
		45 „	
43¼	Piacenza	10 23 „	35·1
		27 „	
78¾	Parma	11 23 „	38
		24 „	
96¼	Reggio	11 52 „	37·5
		53 „	
111¾	Modena	12 16 noon	40·4
		17 „	
134¾	Bologna	12 50 „	41·8
		1 10 P.M.	
195⅛	Pistoia	3 49 „	22·9
		53 „	
219¾	Florence	4 32 „	37·3
		40 „	
271¼	Arezzo	6 26 „	29·1
		30 „	
311	Chiusi	7 34 „	37·2
		39 „	
413½	Rome	10 40 „	34

Including stops = 30·6. Excluding stops = 32·6
(Stops 49 minutes.)

MEDITERRANEO.—1st and 2nd class (from Dec. 1, 1888).

Miles		Time	Speed
	Milan	8 30 A.M.	
21½	Pavia	9 5 „	36·8
		7 „	
37¾	Voghera	9 36 „	33·6
		40 „	
48½	Tortona	9 57 „	37·9
		58 „	
60	Novi	10 17 „	35·3
		26 „	
93½	Genoa	11 55 noon	23·7
		12 16 „	
117¼	Chiavari	1 17 P.M.	23·6
		19 „	
148¼	Spezia	2 32 „	25·8
		37 „	
169¼	Massa	3 13 „	34·1
		14 „	
196	Pisa	3 56 „	38·2
		4 3 „	
286	Grosseto	6 44 „	33·4
		48 „	
309½	Orbetello	7 30 „	33·5
		55 „	
353	Civita Vecchia	9 10 „	34·8
		15 „	
403¼	Rome	10 50 „	31·7

Including stops = 28·1. Excluding stops = 31·4.
(Stops 86 minutes.)

Since this was written the last two admirable new trains have been instituted (December 1888), the credit being due to the action of the Mediterraneo Company. At the same time all the other trains of Italy were quickened and improved, and nearly 2,000 *express* miles were thus added in one day to Italian train service, and the result justifies the wisdom of the late Prime Minister Depretis, who would not give the monopoly of communication to one company. We may shortly hope to see still further improvements at the other points at which competition exists.

The best of the two expresses above, between Milan and Rome, is that of the Adriatico, which has also a much harder course, crossing the Apennines between Bologna and Florence.

SWEDEN.

BEST EXPRESS.

STATE RAILWAY.

1st and 2nd (one way only).

Miles		Time	Speed
	Stockholm	6 0 P.M.	
41	Gnesta	7 35 „	26
		40 „	
69	Flen	8 35 „	30½
		36 „	
83¼	Catrinholm	9 4 „	30
		19 „	
113	Norrköping	10 18 „	30
		24 „	
127¼	Norsholm	10 53 „	30
		55 „	
142½	Linköping	11 23 „	32
		25 „	
162	Mjölby	12 5 A.M.	29½
		13 „	
217	Nässjo	2 1 „	31
		11 „	
270¾	Alfvesta	3 44 „	34½
		50 „	
332¼	Hessleholm	5 32 „	36½
		38 „	
362½	Eslöf	6 34 „	32
		36 „	
374¼	Lund	7 0 „	30
		2 „	
383¾	Malmo	7 20 „	30

Including stops = 28¾. Excluding stops = 32.

The speeds in Sweden are poor, and many trains labelled 'express 1 and 2 only' do not reach an inclusive speed of 20 miles an hour.

The country is no doubt a difficult one for speed, but not half so difficult as Switzerland or parts of Scotland.

Norway is even worse off for fast communication, but the so-called express at least carries third-class folk.

EGYPT.

BEST EXPRESS.

Cairo—Alexandria. 1st and 2nd class.

Miles		Time	Speed
	Alexandria	9 30 A.M.	
65½	Kafr el Zaiat	11 19 „	36
		21 „	
76½	Tantah	11 38 „	38
		40 „	
101½	Benha	12 20 P.M.	38
		23 „	
130	Cairo	1 10 „	37

Including stops = 35½. Excluding stops = 37.

The railway track is perfectly level, but has the peculiarity of being also the high road of the country for droves of cattle, for camels, and even human beings on foot, so that this speed is very creditable.

Total express miles 520. Speed inclusive, 35½; exclusive, 37.

RUSSIA.

BEST EXPRESS.

St. Petersburg—Moscow. (Nicolas Railway). 1st only.

Versts	Miles		Time	Speed
		St. Petersburg	8 30 P.M.	
78	52	Lüban	10 13 „	30⅓
			25 „	
152	101	M. Wischera	11 53 „	33½
			12 3 A.M.	
234	155	Okulowka	2 0 „	28
			8 „	
300	199	Bologæ	3 24 „	35
			32 „	
373	247	Spirowo	4 56 „	34
			5 4 „	
453	300	Twer	6 47 „	31
			57 „	
526	349	Klui	8 29 „	32
			41 „	
592	393	Chimki	10 3 „	32
			4 „	
609	404	Moscow	10 30 „	25

Including stops = 29. Excluding stops = 31½.

SPAIN.

BEST TRAIN (not express).

(Paris) Irun—Madrid (Lisbon). 1st only—Train de Luxe—(since Nov. 1887).

Miles		Time	Speed
	Irun	7 34 A.M.	
			} 25
6¾	Passages	7 50 „	
		51 „	} 34
10	San Sebastian	7 58 „	
		59 „	} 27
26	Tolosa	8 35 „	
		36 „	} 31
36	Beasain	8 55 „	
		9 0 „	} 20
44¾	Zumarraga	9 27 „	
		32 „	} 21
63	Alasua	10 23 „	
		25 „	} 30
90	Vitoria	11 19 „	
		21 „	} 30
110½	Miranda	12 2 P.M.	
		7 „	} 26
122¾	Pancorbo	12 36 „	
		37 „	} 28
166	Burgos	2 10 „	
		16 „	} 31
197¾	Quintana	3 19 „	
		20 „	} 33
218	Venta de B.	3 56 „	
		4 0 „	} 34
241¾	Valladolid	4 41 „	
		46 „	} 31
258	Matapozuelos	5 17 „	
		18 „	} 26
267	Medina	5 39 „	
		44 „	} 30
289	Arevalo	6 28 „	
		29 „	} 30
301¾	San Chidrian	6 54 „	
		59 „	} 30
306	Velayos	7 8 „	
		9 „	} 23
312	Mingorria	7 25 „	
		30 „	} 30
321	Avila	7 48 „	
		53 „	} 32
360	El Escorial	9 42 „	
		47 „	} 32
368	Villalba	10 2 „	
		3 „	} 30
386	Pozuelo	10 40 „	
		41 „	} 32
392	Madrid	10 52 „	

Including stops = 25⅔. Excluding stops = 28.

There is no ordinary train attaining 29 miles including stops except one train (1st and 2nd class) from Madrid to Aranjuez (the Seville express, 6.20 P.M.), which runs the first 30¼ miles in 1 hour 1 minute.

PORTUGAL.

BEST TRAIN.

Madrid—Lisbon. Luxe, 1st only.

Miles		Time	Speed
	Madrid	11 30 P.M.	
19¾	Griñon	12 9 A.M.	30
		12 „	
41	Bargas	12 50 „	33
		55 „	
55¼	Torrijos	1 20 „	34
		24 „	
66⅓	Erustes	1 45 „	32
		48 „	
85¾	Talavera	2 23 „	33
		27 „	
126⅓	Navalmoral	3 39 „	34
		47 „	
145¾	Bazagona	4 19 „	33
		23 „	
179⅓	Canaveral	5 54 „	24
		59 „	
207⅓	Arroyo de Malpartida . . .	7 12 „	23
		17 „	
252	Valencia	9 19 „	22
		0 „	
302	Torre das Vargens	11 16 „	22
		22 „	
344	Entroncamento	12 51 P.M.	29
		56 „	
364	Santarem	1 38 „	29
		41 „	
411	Lisbon	3 15 „	30

Including stops = 25⅔. Excluding stops = 28.

APPENDIX

WITH DETAILS OF EXPRESS MILEAGE

HOLLAND.

Kils.	Miles		No. of Exp. Trains	Speed		Express Mileage	
				incl.	excl.	3rd Cl.	Total
		Dutch Rhenish.					
73	45½	Amsterdam—Rotterdam .	16	34¾	37	728	728
28	17½	Gouda—Haag . . .	15	37½	37½	262	262
60	37½	Nieuwersluis—Haag . .	1	34⅘	35	37	37
92	57½	Amsterdam—Arnheim . .	9	30½	33⅓	517	517
35	22	Do. —Utrecht . .	10	33½	34⅓	220	220
52	32½	Rotterdam— Do. . .	9	34¾	36	292	292
28	17½	Haag—Gouda . . .	8	38	38	140	140
				34⅓	36	2,196	2,196
		North Brabant.					
101	63	Boxtel—Wesel . . .	2	32½	35½	65	126
		State Company.					
150½	94	Groningen—Zutphen . .	2	32	35¼	188	188
46	29	Do. —Neuschanz . .	1	29	30	29	29
104	65	Do. —Zwolle . . .	2	34½	37	130	130
66	41	Leeuwarden—Meppel . .	4	33	34⅗	164	164
66	41	Nijmegen—Tilburg . .	2	30	33	82	82
209	130½	Rotterdam—Oldenzaal . .	2	30	33½	261	261
29	18	Zutphen—Arnhem . . .	1	38	38	18	18
124	77½	Rotterdam—Arnhem . .	3	29½	32⅓	232	232
122	76	Arnhem—Rheine . . .	1	32	38	76	76
49½	31	Dordrecht—Geldermalsen .	2	31½	34	62	62
160	100	Rotterdam—Venlo . . .	7	31¼	35¼	400	700
88	55	Do. —Boxtel . . .	1	29½	33⅓	—	55
61	38	Do. —Roosendaal . .	6	31¾	33½	38	228
47	30	Utrecht—s'Bosch . . .	7	32¾	33⅘	60	210
88½	55	Tilburg—Venlo . . .	1	30¾	36½	—	55
69	43	Do. —Utrecht . . .	1	30	31	—	43
99	62	Breda—Vlissingen . . .	3	33⅘	36½	—	186
120	75	Vlissingen—Tilburg . .	1	40	41¾	—	75
24	15	Breda—Roosendaal . .	8	36	36	60	120
65	41	Roosendaal—Vlissingen . .	2	34	34	—	82
				32	34⅘	1,800	2,996
		Dutch Central.					
88½	55¼	Zwolle—Utrecht . . .	4	32⅗	34⅔	221	221

Kils.	Miles		No. of Exp. Trains	Speed incl.	Speed excl.	Express Mileage 3rd Cl.	Express Mileage Total
		HOLLAND COMPANY.					
85½	53½	Amsterdam—Rotterdam .	19	32⅖	35⅘	749	1,017
47	29½	Do. —Utrecht . .	10	32½	35	295	295
106	66	Do. —Zutphen . .	2	30	33¼	132	132
150	94	Do. —Winterswijk .	2	31¼	35	188	188
45½	28½	Do. —Amersfoort .	8	31⅔	33½	228	228
31	20	Amersfoort—Kesteren .	7	30	31	140	140
59½	37	Amsterdam—Enkhuisen .	4	30⅔	33⅖	148	148
18	11¼	Hilversum—Amersfoort. .	4	33	35	45	45
77	48	Do. —Zutphen . .	1	32¾	36	48	48
23½	14⅗	Rotterdam—Haag . .	2	33	33	29	29
18	11¼	Haarlem—Amsterdam . .	17	29⅓	29⅓	191	191
				31⅗	34⅓	2,193	2,461
		GRAND TOTAL HOLLAND . . .		32½	35	6,475	8,000

BELGIUM.

BELGIAN STATE RAILWAY.

44	27⅓	Brussels—Antwerp . .	27	30	32	632	742
23	14½	Malines— Do. . .	3	32¼	32¼	43	43
29	18	Antwerp—Esschen . .	6	32	32	36	108
125	78	Brussels—Verviers .	4	29½	31⅔	—	312
95	59½	Louvain— Do. . .	3	29½	31½	—	178
100	62	Brussels—Liége . .	12	29⅔	32	558	744
122	76¼	Do. —Ostend . . .	16	32	34½	762	1,220
99	61⅘	Do. —Bruges . . .	3	31½	33½	184	184
57	35½	Do. —Gand . . .	1	30⅓	32¼	35	35
68	42½	Ostend— Do. } Köln trains	4	36	37½	85	170
81	50⅕	Louvain— Do. } Köln trains	3	36½	38⅓	—	151
25	15½	Do. —Malines } Köln trains	6	38¼	38¼	93	93
68	42½	Antwerp—Gand . . .	8	30	31½	340	340
87	54⅓	Brussels—Courtrai . .	1	29	30	55	55
76	47½	Gand—Tournai . . .	2	31⅔	34⅓	95	95
83	52	Brussels—Tournai } Calais London	8	35	37	312	416
52	32½	Ath.—Brussels . . .	1	33⅗	35	32	32
61	38	Brussels—Mons (Paris). .	12	34½	35	228	456
66	41	Gand—Braine-le-Comte } . .	2	29¼	32⅓	82	82
201	125½	Brussels—Bettingen (Switz.)	4	34	35	—	502
192	120	Do. —Arlon . . .	3	30	32¼	360	360
58	36¼	Do. —Namur . . .	3	30	32	109	109
37	23	Charleroy— Do. . . .	4	32	34⅘	92	92
128	80	Liége—Erquelines {Köln Paris	5	28½	30⅜	—	400
		GRAND TOTAL BELGIUM . . .		31¾	33½	4,133	6,919

FRANCE.

Kils.	Miles		No. of Exp. Trains	Speed		Express Mileage	
				incl.	excl.	3rd Cl.	Total
		EST.					
410	255	Paris—Igney Avricourt (Main line to S. Germany)	4	35	39	—	1,020
353	219	Nancy—Paris	1	32	37	—	219
55	35	Reims—Soissons	3	34	35	—	105
86	54	Mezières—Longuyon (Frontier express)	2	30	32	108	108
443	275	Paris—Belfort (Bâle)	8	34	39		2,200
172	107	Do. —Reims	2	33	38	4	214
444	276	Laon—Delle (Calais—Bâle, *viâ* Blesme)	2	36	41	—	552
535	333	Laon—Delle (summer only) *viâ* Epinal	2	36	41	—	666
			24	34½	39	872	5,084
		NORD.					
296	184	Paris—Calais	6	38	42	—	1,104
254	158	Do. —Boulogne	4	37	40	—	632
250	156	Do. —Lille	6	38	40	156	936
113	70	Arras—Dunkirk	4	33	36	140	280
109	68	Lille—Calais	6	36	37	—	408
98	61	Do. —Valenciennes—Aulnoye	2	31	33	61	122
63	40	Busigny—Douai	1	30	33	40	40
231	144	Paris—Feignies (for Brussels)	7	39	40	—	1,008
238	148	Do. —Jeumont (for Cologne)	4	34	35	—	592
131	82	Do. —Tergnier	2	33	34	164	164
197	123	Do. —Hirson	2	32	37	—	246
105	65	Do. —Soissons	2	36	37	—	130
183	114	Do. —Le Tréport	3	31	32	—	342
51	32	Do. —Creil	16	33	34	384	512
271	169	Calais—Laon	2	33	39	—	338
107	67	Amiens—Do.	2	39	40	—	134
117	73	Do. —Rouen	2	36	38	—	146
			71	36	38	945	7,134
		ORLEANS.					
585	364	Paris—Bordeaux, St. J. and B.	12	35½	40	2,160	4,368
578	359						
339	211	Do. —Angers	2	35	41	422	422
88	55	Angers—Nantes	6	34	36½	220	330
751	467	Paris—Toulouse	5	30	34	1,401	2,335
441	274	Do. —Laqueville	3	29	31	822	822
299	186	Vierzon—Périgeux	1	31	34	186	186
52	33	Bordeaux—Coutras	4	33	34	132	132
36	23	Do. —Libourne	2	32	33	46	46
			35	33⅕	37⅕	5,389	8,641

Kils.	Miles		No. of Exp. Trains	Speed		Express Mileage	
				incl.	excl.	3rd Cl.	Total
		MIDI.					
233	145	Bordeaux—Hendaye (Spain)	4	33	36	—	580
239	149	Do. —Pau	2	31	34	—	298
335	208	Do. —Luchon (bad gradients)	2	25	30	—	416
228	142	Morcenx—Luchon	3	30	33	—	426
476	296	Bordeaux—Toulouse (Cette)	4	34	39	—	1,184
136	85	Agen—Bordeaux	1	31	34	85	85
105	66	Narbonne—Cerbère	2	33	35	—	132
59	37½	Bordeaux—Arcachon	5	31	35	37½	187½
			23	31⅗	35⅖	122	3,308
		P.L.M. (Summer Service.)					
863	537	Paris—Marseilles	6	32	36	—	3,222
440	274	Do. —Macon	2	35	38	—	548
455	283	Do. —Pontarlier (Berne Lausanne)	2	28	30	—	566
140	87	Dijon—Pontarlier	2	27	28	—	174
693	431	Paris—Modane	2	32	35	—	862
186	116	Macon—Geneva	2	30	33	—	232
512	318	Paris—Lyons	2	35	39	—	636
355	221	Do. —St. Germain	6	33	37	1,326	1,326
145	90	St. Germain—St Etienne	2	30	33	180	180
65	41	Do. —Clermont	4	29	31	164	164
105	66	Cette—Tarascon	1	29	34	—	66
86	54	Marseilles—Arles	2	38	38	108	108
			33	32	35½	1,778	8,084
		OUEST.					
228	142	Paris—Le Havre	6	31⅓	34	—	852
201	125	Do. —Dieppe	8	29½	35	150	1,000
136	85	Do. —Rouen	2	32	34	—	170
58	37	Do. —Mantes	2	34	34	74	74
69	43	Rouen—Serquigny	3	31	32	43	129
371	231	Paris—Cherbourg	2	29	32	—	462
239	149	Do. —Caen	3	30	34	—	447
220	137	Do. —Trouville	3	33	34	—	411
143	89	Le Mans—Mezidon (Caen)	2	30	33	178	178
610	379	Paris—Brest (bad gradients)	2	28	31	—	758
259	161	Do. —Sable (St. Nazaire)	2	30	32	322	322
374	233	Do. —Rennes	4	30	32	—	932
162	101	Rennes—Le Mans	1	34	36	101	101
315	195	Paris—Angers	3	32	35	—	585
211	131	Do. —Le Mans	1	30	33	—	131
97	60	Le Mans—Angers	1	31	34	60	60
82	51	Rennes—St. Malo (Summer only)	3	31	34	—	153
328	204	Paris—Granville	4	31	34	—	816
			52	30½	33½	928	7,580

Kils.	Miles		No. of Exp. Trains	Speed		Express Mileage	
				incl.	excl.	3rd Cl.	Total
		ETAT (Expresses).					
620	385	Paris—Bordeaux . . .	2	29	32	770	770
67	42	Niort—La Rochelle . .	3	30	31	126	126
153	96	Thouars—Les Sables d'Olonne	1	32	33	96	96
493	307	Paris—Saintes . . .	1	29	33	307	307
			7	29$\frac{6}{7}$	31$\frac{6}{7}$	1,299	1,299
		GRAND TOTAL FRANCE . . .		32$\frac{4}{5}$	36$\frac{1}{4}$	11,263	41,130

NORTH GERMANY.

ALTONA ADMINISTRATION.

285	178	Berlin—Hamburg . . .	4	36	38	356	712
264	164	Altona—Vamdrup (Copenhagen, from Voyens one way only) .	4	32	35	656	656
33	20	Neumunster—Kiel . . .	4	34	35	80	80
			12	34	36	1,092	1,448

MAGDEBURG ADMINISTRATION.

321	200	Berlin (Z. Garten)—Holzminden *viâ* Oschersleben	2	30	34	400	400
326	202	Do. —*viâ* Schoningen . .	2	33$\frac{1}{2}$	35	404	404
183	114	Do. —Gusten (Frankfort-on-Maine)	2	34	36	228	228
221	138	Do. —Thale	2	32$\frac{1}{2}$	35	276	276
255	159	Do. (Z. Garten)—Hannover	8	38	39$\frac{1}{2}$	636	1,272
266	166	Hannover Magd.—Leipsic (partly Hann. D.) .	3	31$\frac{1}{2}$	36$\frac{1}{2}$	498	498
64	40	Oebisfelde—Magdeburg . .	1	33$\frac{1}{2}$	34	40	40
119	74	Magdeburg—Leipsic . .	3	34	36	222	222
147	92	Do. —Hannover (partly Hann. D.) . .	2	33	37$\frac{1}{2}$	184	184
109	68	Do. —Wittenberge .	2	35$\frac{1}{2}$	38	136	136
			27	34$\frac{1}{2}$	37	3,024	3,660

RIGHT RHINE ADMINISTRATION.

179	111	Emden—Münster . . .	2	33$\frac{1}{2}$	38	222	222
57	36	Soest—Münster . . .	1	35	[2]6	36	36
35	21	Münster—Hamm . . .	5	33$\frac{1}{2}$	34$\frac{1}{2}$	84	105
63	40	Oberhausen—Emmerich . .	5	32	35	200	200
71	44	Cologne—Oberhausen . .	2	33	35	88	88
96	60	Do. —Niederlahnstein .	4	33$\frac{1}{2}$	34$\frac{1}{2}$	120	240
			19	33	35$\frac{1}{3}$	750	891

Kils.	Miles		No. of Exp. Trains	Speed incl.	Speed excl.	Express Mileage 3rd Cl.	Express Mileage Total
		HANOVER ADMINISTRATION.					
94	59	Löhne—Rheine	2	31½	35	118	118
37	23	Warburg—Altenbeken	4	33	33	92	92
250	156	Magdeburg—Hamburg (partly Magd.)	2	34½	37	312	312
346	215	Hamburg—Cassel	4	31	34½	432	860
108	67	Göttingen—Hanover	1	31½	34½	67	67
199	124	Cassel—Frankfort	8	31½	33	750	992
122	76	Hanover—Bremen	4	31¼	32¾	304	304
62	39	Bremen—Bremerhaven	2	35	38	78	78
328	204	Cologne—Hanover (partly Rt. Rh. Adm.)	6	34	37	408	1,224
448	279	Do. —Hamburg (Do.)	4	33	35½	558	1,116
			37	32½	35	3,119	5,163
		BERLIN ADMINISTRATION.					
173	108	Frankfort—Posen	2	34	36	216	216
173	108	Guben—Posen	2	31	33	216	216
224	139	Berlin—Stralsund	2	32	34	278	278
201	125	Do. —Angermünde Swinemunde	2	31	34½	250	250
169	105	Do. —Stargard	2	31	34½	—	210
134	84	Do. —Stettin	2	29	32	168	168
174	109	Do. —Dresden (*viâ* Zossen)	3	34	35	327	327
360	224	Do. —Breslau (*viâ* Kohlfurt)	4	32	36⅓	896	896
329	205	Do. — Do. (*viâ* Sagan)	1	32	36	205	205
210	131	Do. —Görlitz	2	30⅓	33	262	262
81	50	Do. —Frankfort-on-Oder	5	33	34	250	250
			27	32	35	3,068	3,278
		ERFURT ADMINISTRATION.					
188	117	Berlin—Dresden (*viâ* Röderau)	4	35⅓	37	468	468
163	102	Do. —Leipzig	7	31½	34½	306	714
148	93	Kohlfurt—Falkenberg	2	30	32½	186	186
58	37	Cassel—Bebra	2	33⅓	33⅓	74	74
270	168	Berlin—Erfurt	2	30	32	168	336
194	121	Weissenfels—Berlin	1	34⅓	36	121	121
372	231	Berlin—Bebra	4	29½	33	231	924
218	136	Leipzig—Do.	2	29	31	272	272
			24	31⅕	33¾	1,826	3,095
		BROMBERG ADMINISTRATION.					
742	461½	Berlin Eydtkuhnen (St. Petersburg) *viâ* Konitz	2	34	36	924	924
776	482	Do. *viâ* Bromberg	2	29⅓	32½	—	964
46	29	Berlin—Dahnsdorf	2	29	30	58	58
351	219	Bromberg—Insterburg	2	29	32	438	438
141	88	Posen—Thorn (Berlin—Warsaw)	2	33	35	176	176
			10	30	32¾	1,596	2,560

Kils.	Miles		No. of Exp. Trains	Speed		Express Mileage	
				incl.	excl.	3rd Cl.	Total
		BRESLAU ADMINISTRATION.					
164	102½	Breslau—Posen	2	29	31	204	204
181	113	Do. —Oderberg	4	29	33	452	452
252	158	Custrin—Breslau	1	30½	34	158	158
			7	29½	32¾	814	814
		LEFT RHINE ADMINISTRATION.					
120	75	Cologne—Cleve	2	30	33	—	150
85	53	Do.—Herbesthal (London)	4	30	31½	—	212
153	96	Do.—Bingerbrück (Frankfort)	6	31	34	—	576
221	137½	Bingerbrück—Metz (also Els-Lothr. Adm.)	3	30	33	137½	412
111	69	Coblenz—Trèves	3	30½	31	207	207
70	44	Diedenhofen—Trèves	2	29½	31	88	88
			20	30⅖	32¾	432	1,645
		FRANKFORT ADMINISTRATION.					
245	153	Frankfort—Göttingen	2	29	31	306	306
203	126	Berlin—Sangerhausen	2	32	33	252	252
53	33	Sangerhausen—Güsten	4	32	33	132	132
217	135	Halle—Cassel	4	30	33	540	540
128	80	Frankfort—Coblenz	4	31	32½	160	320
			16	30⅓	32½	1,390	1,550
		ELBERFELD ADMINISTRATION.					
314	195	Aix—Holzminden (partly Hannover D.)	2	29	31½	390	390
74	46	Hamm—Elberfeld	2	30½	32	—	92
52	33	Cassel—Warburg	3	34⅖	35	99	99
52	33	Deutz—Barmen	2	29	30	—	66
			9	30	32	489	647
		OLDENBURG STATE.					
97	60⅓	Bremen (Neustadt)—Leer	2	30	32	121	121

PRIVATE RAILWAYS.

		UNTER-ELBESCHE.					
102	63	Harburg—Cuxhaven	4	33	33½	252	252
		NORD DEUTSCHER LLOYD.					
126	79	Neustrelitz—Warnemünde	2	32	32	158	158
		LÜBECK BÜCHENER.					
358	223	Hamburg—Stettin	2	29	33	446	446
63	40	Do. —Lübeck	2	30	33	80	80
			4	29¼	33	526	526

Kils.	Miles		No. of Exp. Trains	Speed		Express Mileage	
				incl.	excl.	3rd Cl.	Total
		MECKLENBURG FRIEDRICH FRANZ.					
44	28	Hagenow—Kleinen. . .	2	29	33	—	56
		GRAND TOTAL NORTH GERMANY .		31¾	34⅓	18,657	25,798

SWITZERLAND.

All trains with J. S. of over 44 kils., or 28 miles admitted, and some under that amount on difficult roads.

		VEREINIGTE SCHWEIZER BAHNEN.					
58	37	Winterthur—St. Gallen . .	2	28	31	—	74
50	32	Ziegelbrucke—Sargans Buchs.	2	24	27½	—	64
			4	26	29⅓	—	138
		SCHWEIZER CENTRAL BAHN.					
67	42	Berne—Olten	1	28	29	—	42
55	34½	Olten—Lucerne . . .	4	26	28	—	138
			5	26½	28	—	180
		SCHWEIZER WEST BAHN.					
40	25	(Berne) Neuchatel—Verrières (Paris) . .	2	23	25	—	50
61	38	Geneva—Lausanne . .	2	28	30	—	76
			4	26	28	—	126
		NORTH-EAST RAILWAY.					
23	14¼	Zurich—Baden . . .	5	28	29	43	71
31	20	Do. —Brugg . . .	4	27	29	40	80
58	37	Bâle— Do. (Vienna) . .	4	24½	26	74	148
68	43	Zurich—Lucerne . . .	2	27	29	—	86
58	37	Do. —Ziegelbrucke . .	2	27	27½	—	74
			17	26½	27¼	157	459
		JURA, BERNE, LUCERNE.					
80	50	Bâle—Delle (Calais—Paris) .	8	24½	25½	—	400
95	59	Berne—Lucerne . . .	2	25½	26	—	118
			10	24¾	25⅖	—	518
		GOTHARD RAILWAY.					
232	144	Lucerne—Chiasso . . .	6	21	23½	—	846
		GRAND TOTAL SWITZERLAND .	46	24⅖	26	157	2,285

DENMARK.

Miles		No. of Exp. Trains	Speed		Express Mileage	
			incl.	excl.	3rd Cl.	Total
20	Copenhagen—Roskilde . . .	2	30	31	40	40
76	Do. —Masnedsund . .	2	30	31	152	152
69	Do. —Korsör . . .	4	30	31	275	275
105	(Hamburg) Fredericia — Randers (Stockholm)	1	29	31½	105	105
69	Fredericia—Aarhaus . . .	1	29½	31½	69	69
24	Vamdrup—Fredericia . . .	2	32	33	48	48
52	Strib—Nyborg	2	32	34	156	156
	GRAND TOTAL .	14	30⅕	31½	845	845

SOUTH GERMANY.

Kils.	Miles		No. of Exp. Trains	Speed		Express Mileage	
				incl.	excl.	3rd Cl.	Total
		ELSASS-LOTHRINGEN ADMINISTRATION.					
34	21	Mülhausen—Alt Münsterol .	6	30	31	42	126
208	130	Weissenburg—Basel . .	4	30	33½	—	520
141	88	Strassburg—Basel . . .	3	32½	35	88	264
32	20	Basel—Mülhausen . . .	2	30	30	—	40
91	57	Strassburg—Deutsch Avricourt	4	31¼	32¼	—	228
71	44	Do. —Saarburg (Ostend —Bâle) . . .	4	33½	34½	88	176
154	96	Saarburg—Luxemburg . .	4	34	37	192	384
			27	31¾	34	410	1,738
		HESSE-LOUIS RAILWAY.					
69	43	Frankfort—Bingerbrück . .	2	29½	34½	43	86
46	29	Mainz—Worms . . .	4	32	33	58	116
76	47	Do. —Aschaffenburg . .	4	29½	33	47	188
41	25	Frankfort—Aschaffenburg .	2	30	31	—	50
81	50	Do. —Mannheim . .	2	32½	33½	100	100
76	47	Mainz—Mannheim . . .	3	33	35½	47	141
			17	31	33¾	295	681
		PALATINATE RAILWAYS.					
46¾	29½	Neustadt—Weissenburg . .	6	31	32⅓	59	177
72	44	Do. —Munster . . .	3	29½	30	—	132
118	74	Schifferstad Strassburg (partly Els. Lothr. Adm.)	2	30	32	148	148
			11	30⅕	31¾	207	457

Kils.	Miles		No. of Exp. Trains	Speed		Express Mileage	
				incl.	excl.	3rd Cl.	Total
		BADEN STATE RAILWAY.					
62	38¾	Mannheim—Carlsruhe	2	36	37	—	77½
252	156½	Heidelberg—Bâle	4	30	34½	157½	626
54	33½	Do. —Carlsruhe	3	31	33½	64	99¾
197	123	Carlsruhe—Bâle	2	36	38	—	246
64½	40	Do. —Appenweier	7	34	37	123	280
18½	11¾	Mannheim—Heidelberg	2	29	30	—	23½
20¾	13	Appenweier—Strassburg	2	32	32	—	26
144½	90	Bâle—Constance	1	29	32	90	90
55½	35	Waldshut—Bâle	2	30	32	70	70
30¼	19	Constance—Singen	3	30	31	19	57
43½	27½	Carlsruhe—Mühlacker	2	30	31	—	55
			30	32	35	524	1,651
		MAIN NECKAR RAILWAY.					
87½	55	Frankfort—Heidelberg	5	32	34	55	275
		SAXON STATE RAILWAYS.					
102	63	Görlitz—Dresden	4	31	32	252	252
115	71½	Leipzig—Dresden	6	33½	34½	429	429
62	39	Dresden—Bodenbach	4	32½	32½	156	156
165	103	Leipzig—Hof	2	29½	31	—	206
			16	32	33	837	1,043
		WURTEMBERG STATE RAILWAY.					
78½	48¾	Bietigheim — Osterburken (single)	2	29	31	—	97½
140½	87	Mühlacker—Ulm	2	29	30	—	174
103½	64	Ulm — Friedrichshafen (single line)	2	31½	33	128	128
			6	30	31	128	400
		BAVARIAN STATE RAILWAY.					
89	55½	Aschaffenburg—Würzburg	7	30	31	111	388
102	63½	Würzburg—Nürnberg	2	29	30	—	127
219	136	Nürnberg—Passau (single)	2	29½	30½	—	272
151	94	Do. —Eger	2	30	31½	—	188
90½	56½	Do. —Crailsheim	1	29	33	—	56
219½	136½	Munich—Weiden	3	29	31	—	409
68	42¾	Do. —Buchloe	4	31	32	—	171
70	44	Augsburg—Nordlingen	2	30½	31	—	88
146½	91	Ulm—Munich (partly single)	6	31	32½	—	546
123	76½	Munich—Simbach	2	33	33	—	153
99	62	Do. —Kufstein	3	30½	32	—	186
64¾	40	Do. —Rosenheim	4	31	32	—	160
153	96	Do. —Salzburg	1	30½	31	—	96
			39	30¼	31½	111	2,840
		GRAND TOTAL SOUTH GERMANY		31⅕	33	2,567	9,085

AUSTRIA.

Kils.	Miles		No. of Exp. Trains	Speed		Express Mileage	
				incl.	excl.	3rd Cl.	Total
		AUSTRO-HUNGARIAN STATE (Private), EASTERN SECTIONS.					
268	167	Vienna—Leopoldstadt Sillein	2	29	32	334	334
770	479	Do. —Orsova (Bucharest)	4	31¾	34	—	1,916
278	173¾	Do. —Pest	2	33½	35	—	347
		AUSTRO-HUNGARIAN STATE (Private), NORTHERN LINES.					
540	335	Bodenbach—Vienna	2	32½	35	670	670
384	239½	Do. —Brunn	2	36½	38½	479	479
254	158	Prague—Brunn	2	36½	38½	316	316
		Grand Total	14	32¾	34¾	1,799	4,062
		EMPEROR FERDINAND'S NORTHERN RAILWAY.					
276	171½	Oderberg—Vienna (Berlin & St. Petersburg)	2	30½	32	343	343
144	90	Brunn—Vienna	4	34¼	36	360	360
50	32	Vienna—Marchegg	3	32	34	60	96
		Grand Total	9	32½	34	763	799
		HUNGARIAN STATE (State).					
222	138	Bruck—Buda Pest	2	32	34	—	276
142	88¾	Raab—Buda Pest	2	29½	30	177	177
347	215	Buda Pest—Semlin (Belgrade)	2	29	31	430	430
312	194	Do. —Ruttek	2	29	32	388	388
246	153	Pest—Gross Wardein	2	30	32	—	306
272	169	Do.—Kaschau	2	29	32	—	338
		Grand Total	12	29⅗	32	995	1,915
		K.K., OEST. STAATSBAHN.					
456	284	Vienna—Eger	3	30	32½	284	852
349	217½	Pilsen—Vienna	1	29	32	217½	217½
164	103	Gmund—Vienna	1	34	35¼	103	103
186	116	Do. —Prague	2	35	37	232	232
38½	24	Wessely—Budweis	1	30½	33	24	24
314	195	Vienna—Salzburg	2	30¾	32	—	390
306	190	Do. —Simbach	2	32¼	33¼	—	380
245	153	Do. —Neumarkt (Cologne)	2	31½	33¼	—	306
215	134	Do. —Wels	1	29½	32	—	134
432	268½	Salzburg—Buchs (Arlberg)	2	24¼	25¾	—	537
134	83½	Wörgl—Landeck	2	29¼	33	167	167
437	271¾	St. Valentin—Pontafel (Mountains)	2	25¼	28	543	543
40	25	Bregenz—Feldkirch	2	33	35	—	50
5	33	Neumarkt—Passau	2	33	35	—	66
		Grand Total	25	29½	31½	1,570	3,991

Kils.	Miles		No. of Exp. Trains	Speed		Express Mileage	
				incl.	excl.	3rd Cl.	Total
		AUSTRIAN NORTH-WEST RAILWAY.					
458	285	Tetschen—Vienna . . .	1	29	30¼	—	285
160	99	Do. —Kolin . . .	2	29	31	99	198
100	62	Vienna—Znaim . . .	3	30	30	124	186
			6	29¼	30½	223	669
		BUSCHTERADER BAHN.					
52	33	Carlsbad—Eger . . .	1	29	30	—	33
48	30	Do. —Kaaden . . .	2	29	29	—	60
			3	29	30	—	93
		SÜDBAHN (Private).					
304	189	Kufstein—Ala (Brenner) .	2	22¼	25	—	378
596	370⅓	Vienna—Trieste (Soemmering)	4	25¾	28	740	1480
191	119	Do. —Leoben (Venice) .	2	24	26½	—	238
334	207½	Pragerhof—Buda Pest . .	1	29¾	32	207½	207½
			9	25⅓	27¾	947	2,303
		GRAND TOTAL AUSTRO-HUNGARY .		30	32	6,297	13,832

IRELAND.

Miles		No. of Exp. Trains	Speed		Express Mileage		
			incl.	excl.	3rd Cl.	% of Total	Total
	GREAT SOUTHERN AND WESTERN.						
165½	Dublin—Cork . . .	4	36¼	39	331	—	662
30¼	Do. —Kildare . . .	2	31¼	31½	60	—	60
58½	Cork—Limerick Junc. . .	2	29¼	31	—	—	117
11¾	Do. —Queenstown . . .	4	32	33	23½	—	47
		12	34⅘	37	414	47	886
	MIDLAND GREAT WESTERN.						
126½	Dublin—Galway . . .	2	33	36	—	—	253
84	Mullingar—Sligo . . .	2	33¼	34⅔	—	—	168
88	Athlone—Ballina . . .	2	30	34½	—	—	176
15⅓	Westport—Manulla . .	3	32	33	—	—	46
		9	32⅕	35⅕	—	—	643

Miles		No. of Exp. Trains	Speed		Express Mileage		
			incl.	excl.	3rd Cl.	% of Total	Total
	DUBLIN, WICKLOW AND WEXFORD.						
12	Dublin—Bray	2	29	29	24	100	24
	WATERFORD AND LIMERICK.						
55½	Waterford—Limerick Junc.	1	29	33⅓	56	—	56
22	Limerick Junc.—Limerick	4	31	33	66	—	88
		5	30	33	122	94	144
	BELFAST AND COUNTY DOWN						
12¼	Belfast—Bangor	5	30	32	61	100	61
	GREAT NORTHERN OF IRELAND.						
113	Dublin—Belfast	2	37⅔	40	226	—	226
54	Do. —Dundalk	2	31	32	108	—	108
32	Do. —Drogheda	2	30	31	64	—	64
58½	Belfast—Dundalk	1	29¼	31¼	58½	—	58½
41¼	Portadown—Omagh	2	33	34	82½	—	82½
14½	Do. —Dungannon	4	31	32	58	—	58
34	Londonderry—Omagh	2	34	35	68	—	68
		15	33⅖	35	665	100	665
	BELFAST AND NORTHERN COUNTIES.						
94½	Belfast—Derry	1	29	34	94½	—	94½
68	Portrush—Belfast	1	30	34	33	—	68
61½	Belfast—Coleraine	1	30¾	31	61½	—	61½
61½	Ballymena—Derry	2	29	32	123	—	123
24	Belfast—Larne	2	33	34	48	—	48
		7	30	33	360	91	395
	GRAND TOTAL IRELAND		33	35	1,646	58	2,818

ROUMANIA.

Kils.	Miles		No. of Exp. Trains	Speed		Express Mileage	
				incl.	excl.	3rd Cl.	Total
382	237½	Verciorova—Bucharest	4	29	32	—	950
78	48¼	Bucharest—Giurgevo	2	32	32	—	97
129	80	Do. —Buzeu (Berlin)	2	29	31	—	160
			8	29¼	32	—	1,207

ITALIAN RAILWAYS.

Kils.	Miles		No. of Exp. Trains	Speed		Express Mileage		
				incl.	excl.	3rd Cl.	% of Total	Total
		MEDITERRANEAN.						
334	207	Rome—Pisa	4	30	32	414	—	828
75	47	Pisa—Spezia	2	29	30	47	—	94
91	57	Turin—Alessandria	9	31	32⅓	—	—	513
43	27	Mortara—Alessandria	2	30	31	—	—	54
97	60⅓	Novi—Milan	4	30½	32	—	—	242
97	60½	Alessandria—Piacenza	2	29	30	—	—	121
144	90	Turin, P.S.—Milan	2	29⅓	32	—	—	180
260	162	Rome—Naples	4	29	30	—	—	648
79	49	Florence—Pisa	3	30	31½	147	—	147
			32	29⅘	31½	608	21	2,827
		SICILY.						
48	30¼	Messina—Taormina	2	30	31	—	—	60
		ADRIATIC.						
147	92	Piacenza—Bologna	4	29	31	—	—	368
316	196¾	Florence — Rome (bad gradients)	3	28¾	30	392	—	590
84	53	Rome—Orte	1	31	32	53	—	53
257	160	Milan—Mestre (Venice)	1	29½	32½	160	—	160
102	63½	Modena—Verona	2	29	31	—	—	127
150	93	Milan—Verona	1	29⅓	31⅓	—	—	93
127	79½	Udine—Mestre (Venice)	4	29½	31	—	—	318
175	109	Foggia—Pesciera	1	29	32	—	—	109
		Piacenza—Brindisi (once weekly Indian Mail)	..	--	30	—	—	—
			17	29	31	605	33	1,818
		GRAND TOTAL		29⅓	31¼	1,213	26	4,705

SWEDEN.

Miles		No.	Speed		Total Express Milage
			incl.	excl.	
384	Stockholm—Malmö (Copenhagen)	1	29	32	384
166	Malmö—Nasjö	1	28	31	166
41	Stockholm—Upsala	2	30	30	82
			28⅘	31½	632

EGYPT STATE RAILWAY.

Miles		No.	Speed		Total Express Milage
			incl.	excl.	
130	Alexandria—Cairo	4	36	37	520

RUSSIA.

(No 3rd class on any express.)

	Versts	Miles		No.	Speed		Total Express Mileage
					incl.	excl.	
Warsaw—Bromberg Rly.	212	140	Warsaw—Alexandrovo	2	29	33	280
Do. Petersburg Rly.	836	551	(Berlin) Wirballen / St. Petersburg	2	29	33	1102
Nicolai Rly. (Grand Russian) .	609	403	Moscow—St. Petersburg	2	29	31	806
South Western Rly. .	147	97	Kasatin—Kieff	2	29	30	194
Do. . . .	514	339	Odessa—Wolozyska / (Berlin)	2	28½	30	678
				10	29	31⅓	3060

NORWAY.

Miles		Speed	
		incl.	excl.
349	Christiania—Drontheim . . .	20½	23

The express trains of all the principal countries of the world have now been examined, and there remains the question, what is the good of it all? Do we prove any facts of value to human beings, and does it make any difference whether we are whirled to London from Edinburgh in 8 hours at English speeds, or from Cologne to London (20 miles less distance) in exactly double the time?

The best answer is to quote the words of Mr. Bryce's recent book, when he gives some explanation of the reasons for supposing that England and America will be better friends in the future. . . . 'Considering how intense was the hatred felt in the United States towards England fifty years ago . . . it is one of the remarkable events of our time that a cordial feeling should now exist between the two

chief branches of the English race. The settlement of the Alabama claims has contributed to it. The democratisation of England and the growth of literature and science in America have contributed to it. The greater respect which Europeans have come to show to America has contributed to it. But the ocean steamers have done perhaps most of all, *because they have enabled the two peoples to know one another.*'

The italics are ours, but the moral is clear without italics. When it was a two days' journey from London to Calais, prejudices existed in the minds of Englishmen towards Frenchmen, and *vice versâ*, which must at any rate be partially dissipated when many thousands of each nationality meet the other in the course of a month, and when they can leave London after breakfast, spend four hours in France, and be back to dinner. Indeed, we may even suppose that in another hundred years English prejudice may be sufficiently soothed to allow the acknowledgment that a Frenchman 'invented' a locomotive prior to an Englishman, a fact which we have tried to illustrate on the cover of this book.[1] Yet it may be said, this is an obvious truism; steam has, of course, revolutionised the world materially, and would have done so whether railways were under State management or private management, and whether trains went at 20 or whether they went at 50 miles an hour. To this we would answer, that it is of some importance to the individual to determine the best manner of carrying out revolutions. The English and American tendency towards private enterprise, tempered by competition, has many and obvious faults, and the public are angry and impatient because competition does not work immediately and universally, or indeed logically. For there is an apparent uniformity—though on a lower level of excellence—in the early plans of any Government administration, which is very alluring to the definite and systematic mind of the Frenchman or German, and which seems to be growing more popular in this country. The question is, does this systematic plan produce as good effects in the long run as the rough and unscientific and somewhat more expensive methods of England? The object of this book has been to show that it has not done so in practice as regards railway questions. If the universe were governed by an autocrat, a centralised and more perfect scheme might no doubt be found workable in this and in other matters.

But under existing human conditions it certainly appears, from our figures, that those countries which have given freest scope to private energy have obtained the fullest reward.

[1] To Mr. Cameron Swan we are indebted for these accurate drawings of the earliest known locomotive, that of M. Cugnot, and of its latest descendant, the beautiful new 'single' of the Midland Company, whose feats are displayed on pp. 10 and 23.


MURDOCH 1784 · TREVITHICK 1803 · GURNEY
1771
CUGNOT
HEDLEY 1815 · STEPHENSON